Santa Rosa Islands
Land Bird Monitoring Handbook

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I. ACKNOWLEDGEMENTS

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II. INTRODUCTION

This monitoring handbook has been compiled as an aid for the resource management staff of Channel Islands National Park for assessing changes in relative population levels of land birds on Santa Rosa Island. A similar handbook (van Riper et al., 1988) already exists for land bird monitoring on San Miguel, Santa Barbara, and East Anacapa Islands, but the protocol outlined in that volume was not found to be suitable for Santa Rosa because this island has a greater complexity of habitat types and topography. The primary objective of this handbook is to supply a protocol that will provide, on an annual basis, species and relative numbers of breeding land birds on Santa Rosa. Counts on Santa Rosa Island are made twice annually, once during the spring breeding season and once during the early post-breeding period, to provide information on relative abundances of all breeding species in each of the major habitat types on the island. With these data, the park resource management staff will be able to detect changes in the relative abundance and/or habitat usage of land birds which may be influenced by, or are the result of, changes in island resources or management practices.

III. MONITORING DESIGN CONSIDERATIONS

Of prime importance for design of an avian monitoring protocol is deciding which scale of abundance, or degree of resolution, is necessary to provide answers to the questions of interest (Verner, 1988). Absolute densities of birds provide the finest resolution and allow for some comparisons not otherwise possible, but they are extremely labor and time intensive. The increased number of person hours in the field that are required to produce absolute bird densities, could potentially be very damaging to the fragile island vegetation in Channel Islands National Park. This is particularly true if the counting is conducted regularly over a period of years.

As with the protocol for the three smaller islands (van Riper et al., 1988), avian monitoring for Santa Rosa Island was designed to provide an index of relative abundance and has the potential to provide an estimated density (at least of the most numerous species). These are sufficient for monitoring annual trends of populations within the bird communities of the different habitats and can provide general information on changes in habitat usage (Sogge et al., 1989).

Santa Rosa is a much larger island and supports several woodland habitat types not found on the smaller islands. Therefore, we felt that the protocol used for the three smaller islands was found not entirely satisfactory for use on Santa Rosa Island. For example, the topography of much of Santa Rosa is much steeper, requiring that moving

observers must often divert their attention away from the birds to watch their footing. We thus selected the circular-plot method of Reynolds et al. (1982) for counting because it was designed for such structurally complex habitats and rugged terrain. The observer remains stationary for the duration of a count period, counting all birds detected within a given radius of the observer. In this way, the observer can allocate his complete attention to avoiding sensitive vegetation and dangerous footings during transit between stations. The circular-plot method is less appropriate for open grassland habitats because birds in grasslands tend to flush farther distances when an observer approaches, leaving count circles empty at the start of a count. For the three grassland types and the salt marsh counts we were forced to return to the walking trail count method (Sogge et al., 1989; van Riper, 1982), which was also utilized for the smaller Channel Islands.

To allow the resource manager to differentiate among population trends in the different habitat types, transects of count stations were placed through each of the major habitat types of potential importance to upland land birds. Transect sites were established with the following criteria in mind: (a) how typical the habitat was, (b) whether the tract was large enough for 10–20 stations, (c) the proximity of the site to major roads, park housing, and other count areas, and (d) whether vegetation disturbance could be minimized. With a few exceptions, transects were placed within walking distance of either the ranch area at Beecher's Bay or of Johnson's Lee, or along the North-South Highway. This will facilitate access to the transects if the use of ground vehicles is reduced in the future. Even with these placements, observers will still have to wake well before dawn in order to walk to some of the areas. The exceptions are transects in the western and Stipa pulchra-type grasslands, the estuaries, and some of the coastal scrub, for which no suitable habitat exists near the island's core areas. For some habitat types, notably the Island Oak Woodland, it was at times difficult to find stands large enough so that the count circles contained only the habitat being monitored at that site.

Transects were established in the nine habitat types listed in Table 1. The Canyon and Chaparral stations are divided between north-facing and south-facing sites and the Grassland stations are divided between the perennial Stipa pulchra-dominated type on the eastern end, the annual-dominated interior mountain type, and the exceptionally short type on the western end of the island. Habitat typing was decided after conversations with Dr. William Halvorson, a resident Channel Islands National Park scientist, and follows the classification in Clark et al., 1990. An additional distinction within the Canyon habitat was that between wooded areas (usually having two or more bowls of greater than 3 meters in height) and scrub areas. The stations in both Canyon transects are evenly divided between these two types. Most transects were placed around or near to vegetation monitoring transects. For future cross referencing purposes, we have provided in Appendix II the locations of the nearest vegetation transect to each land bird transect.

At least 30 land bird species are known to breed, or show signs of possible recolonization in the near future, on Santa Rosa Island (Diamond and Jones, 1980; Jones et al., 1989; see also Table 2. of this monitoring handbook). Of these species, some (Snowy Plover, Black Oystercatcher, and Peregrine Falcon) are mostly relegated to coastal cliffs and beach habitats which fall outside the scope of this protocol. Moreover, the timing of their breeding activities may be significantly out of synchrony with that of the other land bird species. The Common Barn Owl is nocturnal and rare, and as a result is unlikely to be detected with significant regularity by the counting techniques herein employed. A special survey methodology will have to be employed for

Table 1. Major Santa Rosa Island habitat types and land bird monitoring transect locations.

Habitat Type	Location	Code	Number of Stations
Torrey Pines	Beecher's Bay	T	10
Island Oaks	Black Mountain	I	7
	Soledad Mountain	I	3
Mixed Woodland Types	Black Mountain/Cherry Canyon	W	12
North-facing Canyon • Wooded (#'s 1,2,3,4,7,8,9,10,13,18) • Scrub (#'s 5,6,11,12,14,15,16,17,19,20)	Lobos Canyon	LC	20
South-facing Canyon • Wooded (#'s 1,6,7,9,11,13,14,15,16,17) • Scrub (#'s 2,3,4,5,8,10,12,18,19,20)	La Jolla Vieja Canyon	JV	20
Coastal Scrub	Cherry Canyon	CC	5
	Upper Soledad Canyon	SC	10
Lupines	Carrington Point	L	20
Chaparral	Beecher's Bay	C	10
	South Point Road	SP	20
		TOTAL	137

			Number of Trails
Grasslands	Pocket Field	WG	2
	East Point	SG	2
	Black Mountain	MG	2
Estuaries/Salt Marshes	East Point	EM	2
		TOTAL	8

these species, such as the island census of Snowy Plover breeding pairs currently being undertaken by other monitoring groups in the park. The introduced Chukar was not detected during any of our trips to the island and is either relegated to parts of the island too remote for inclusion in this protocol or has been extirpated from the island.

Annual reproductive success of the island's land bird species cannot be adequately determined from this protocol. Those population changes brought about through reproduction and mortality cannot be distinguished from changes that occur through immigration and emigration. It is also logistically impossible to determine the reproductive success of all of the species that breed on the island because of the many diverse habitats that occur at widely spaced locations over the island. In the future, it may be desirable to adopt the recommendations of van Riper et al. (1988) for monitoring indicator species from each of the major feeding guilds present on the island, if questions regarding land bird reproductive success become important. Conclusions can then be drawn through extrapolation, but with some provisions, regarding the reproductive success of other species of that guild.

Table 2. Breeding species of Santa Rosa Island upland habitats (from Diamond and Jones, 1980; Jones et al., 1989). Species that are not present on the island during the winter are signified by the symbol “NR”.

Red-tailed Hawk	RTHA	resident
American Kestrel	AMKE	resident
Peregrine Falcon	PEFA	resident, future breeder?
Chukar	CHUK	introduced, still present?
California Quail	CAQU	resident, introduced
Snowy Plover	SNPL	resident
Killdeer	KILL	resident
Black Oystercatcher	BLOY	resident
Mourning Dove	MODO	resident
Common Barn-Owl	BOOW	resident, breeder?
Burrowing Owl	BUOW	resident?, breeder?
White-throated Swift	WTSW	resident?
Allen's Hummingbird	ALHU	resident,
Pacific-Slope Flycatcher	PSFL	NR (was Western Flycatcher)
Black Phoebe	BLPH	resident
Horned Lark	HOLA	resident
Barn Swallow	BARS	NR
Common Raven	CORA	resident
Rock Wren	ROWR	resident
Bewick's Wren	BEWR	resident
Northern Mockingbird	NOMO	resident
Loggerhead Shrike	LOSH	resident
European Starling	EUST	resident, introduced
Hutton's Vireo	HUVI	resident
Orange-Crowned Warbler	OCWA	resident
Rufous-Sided Towhee	RSTO	resident
Chipping Sparrow	CHSP	NR?
Song Sparrow	SOSP	resident
Western Meadowlark	WEME	resident
House Finch	HOFI	resident
Lesser Goldfinch	LEGO	resident

The three species chosen by van Riper et al. (1988) for the smaller islands—American Kestrel (carnivorous guild), Song Sparrow (granivorous guild), and Orange-crowned Warbler (insectivorous guild)—are also appropriate for Santa Rosa. Additionally, because of the greater habitat diversity on Santa Rosa Island, such detailed studies should be planned in two structurally different habitats for each species (e.g., Mixed Woodland and Lupines), so as to detect changes that are more habitat-dependent. It would be necessary to replace the Orange-crowned Warbler with the Western Meadowlark in the more open habitat

type, as there is no common, easily studied insectivore found in both of these two structural types.

The circular-plot protocol of Reynolds et al. (1982) can also be used unchanged to monitor the populations and habitat usage of non-breeding winter resident species, such as the Acorn Woodpecker, Yellow-rumped Warbler, and White-crowned Sparrow. Non-breeding species constitute a significant proportion of the winter bird population on Santa Rosa and would be sensitive to changes in island resources or management practices. Some may potentially become breeders, especially if the woodland habitats expand following elimination of the alien pigs and ungulates on the island.

IV. MONITORING PROTOCOL

The objective of this protocol is to detect changes in abundance and distribution of land birds on Santa Rosa Island. In order to accomplish this objective, it will be necessary to monitor the species and relative numbers of land birds present in each habitat type on the island. This is done with annual counts, made during both breeding and non-breeding periods. One of two different counting methods is used--the circular-plot or the walking-transect--depending on the habitat type being monitored.

A. METHODS

Counts will be conducted both during the spring breeding season and the fall non-breeding season, using either circular plot or walking transect methods, depending on the habitat. Each transect of stations will be run according to the directions contained in a succeeding section of this handbook and all birds seen or heard will be counted and entered into a hand-held data logger (the Psion explained below). Species that breed on Santa Rosa Island are of primary interest; however, all species should be noted. Birds will be counted when either an aural or visual detection is made. It is therefore very important that the observers are familiar with the morphology, behavior, and vocalizations (both songs and call notes) of each breeding land bird species. In this manner, the observers will feel comfortable making rapid identifications of each bird they hear and/or see.

1. The Circular-plot

Circular-plot counts are conducted at or near stations that have been pre-established and are kept constant from year to year (see the directions and accompanying maps). The stations are marked by either a piece of iron rebar or by a piece of aluminum angle-iron driven into the ground or supported by rocks. Stakes extend from 5 cm to about 80 cm above the ground. Where the stakes are low to the ground, they are adjacent to a large rock or cairn of rocks and it is noted what to look for in the directions to that count station. All stations have a round aluminum identification tag wired to the stake or fixed to the ground at the base of the cairn. Each tag is marked with the word "BIRD" on one side and a station identification code (such as "LC12") on the other.

Once the observer arrives at the station marker:

1. Stand silently and motionless at the station for one (1) minute to wait for the abatement of any disturbances caused by the observer's approach to the station. This time can be used for starting up the program or entering weather data, but do not press 'A' at the first choice menu until this minute is completely

over. This is important in order to prevent the Psion from recording the wrong starting time for the count.

2. The observer rotates slowly in place, scanning the surrounding vegetation and sky for birds, and recording any detections for ten (10) minutes. Record all sightings of birds seen and/or heard within a radius of 50 m from where the observer is standing. The observer may not leave the station to get a better look at a bird difficult to identify until after the ten minute period.

[diagram of circular-plot]

3. Proceed to the next station as quickly and quietly as possible.

When conducting the counts, it is not always possible to stand directly next to a station-marker. Stakes are often driven into a cliff-side or otherwise out of the way of cow and human foot traffic. It should be possible, however, for all counts to be made within two meters of the station markers. The directions often make note of where the observer should stand relative to the stake.

2. The Walking-transect

Walking-transects are used for the three grassland types and for the estuary area (which was further modified because of its very small size and the skittishness of the birds that are often found there--see the directions). Starting and ending points are marked by either cairns of white rocks or by one large white rock Either type of marker has an identification tag staked at its base. Once the observer arrives at the cairn marking the start:

1. Stand silently and motionless at the cairn for one (1) minute to wait for the abatement of any disturbances caused by the observer's approach to the station. This time can be used for starting up the program or entering weather data, but do not press 'A' at the first choice menu until this minute is completely over. This is important in order to prevent the Psion from recording the wrong starting time for the count.
2. The observer walks each trail at a moderately slow, steady pace, scanning the surrounding vegetation and sky for birds, and pausing only to confirm identification of a bird.

[diagram of walking-transect]

Record all sightings of birds seen and/or heard within 50 m to either side of the transect line being walked. Count only those birds detected in the area in front of the observer or directly to the sides. Do not count birds detected behind the observer. Enter detections as one would for the circular-plot counts, except that the distance is distance perpendicular to the transect line, not distance to the observer.

3. Press 'E' to exit when the observer has reached the end-marker, but rather than pressing 'Q' to quit, press 'A' again to add a blank record that notes the stopping time.

3. General Rules for Conducting Counts

- Wear earth-tone colors (browns, dark or dull greens, dark blues, grays). Do not wear bright colors (reds, yellows, whites, etc.).
- Do not talk or make unnecessary noises when walking between stations.
- When passing between stations, move as quickly and directly as possible without jeopardizing safety, quietness, or vegetation.
- Avoid counting the same bird more than once. A soaring raven may circle over several stations during a count, but should only be counted at the first station where it was detected. Another example is a bird which clearly flies from one count circle to a shrub or tree in another. In this case, it is only counted as one observation within the first count circle, however, unless the observer can be reasonably certain that a particular individual bird has been counted previously, it should be considered a separate sighting.
- Birds may be counted if they are on the ground, in vegetation, or in flight. A flying bird may be counted at any height, as long as its shadow from a sun directly overhead would fall within the area being counted (50 m from the observer or from the walking transect line).
- Birds may be detected aurally if call notes or song are clearly heard and recognized. Many songs can be heard from distances greater than 50 m, so try to visually locate the singing bird to accurately determine the distance and confirm that it is within the count area. If you are not certain of this, do not count it.
- Use the comments field on the Psion for any additional information that may be helpful later, such as field marks on an unidentified species.
- Non-breeding species should be counted if they can be easily identified and if this can be done without interfering with the detection and entering of breeding species. At this time, breeding species are of the greatest concern, but this may change.
- A bird that is detected in a count circle but leaves before that station's count period starts may be counted only if no others of this species are detected during that station's count period.

Remember: The goal is not the **largest** count possible, but the most **accurate** count possible. Stick to the methods outlined in this handbook. Do not bend the rules to include more birds because you think that you do not have enough. Do not list a bird unless you are sure of its identification. The accuracy and integrity of the count can only be maintained by minimizing variations in methodology. This is accomplished by rigorously following the established count procedures.

B. REQUIRED COUNT CONDITIONS

Counts can be conducted only if conditions meet the following criteria:

- Visibility is greater than 400 m.
- Wind is 10 knots or less.
- It is not raining.
- No one has walked or driven through the area being counted within 30 minutes prior to the count.
- Only one observer is within each count circle (no additional persons may accompany the observers into the transect areas).
- The avian counts must be the first priority of the observers. No other tasks should be undertaken during the count period. For example, if it is necesary to transport materials around the island, it must not in any way detract from the time and attention the observer is giving the counts. Nor should it affect the pace at which the observer covers the count routes.

C. MATERIALS

- Psion Organiser or comparable hand-held data logger (alternatively, a census data sheet can be used)
- Extra 9 volt batteries (one for each Psion; must be carried on all counts)
- Transect instructions and map
- Watch with second hand or read-out, or a timer
- Binoculars
- Bird field guide

D. THE PSION ORGANISER

This protocol was designed to be conducted with the use of two Psion Organiser II hand-held data-loggers (Psion PLC, United Kingdom), one for each observer. The advantage of these devices is that more information can be taken more quickly, once the observers are familiar with the keyboard. Moreover, data collected in the field can be down-loaded directly into the microcomputer system currently being used by the park without the time, expense, and transcription errors that come with data input from paper field notes. A disadvantage is that it is harder to access and review or change the data collected while one is still in the field. If Psions are not available, tally sheets can be drawn up, but they are likely to be harder to use because .of the large number of breeding species found on Santa Rosa and the need for a new sheet for each station.

A simple program, 'BIRD2' (Appendix I), has been written by Charles Drost and Paul E. Super which allows the observer to input count data and weather data into separate data files. The program was not designed to allow the correction of data previously entered into the Psion, as this process is more simply accomplished after down-loading into a microcomputer. Detailed instructions for the use of program 'BIRD2' accompany it in Appendix I.

E. PERSONNEL

This protocol was designed for two observers to be conducting the counts simultaneously at different stations. This reduces the number of days required to complete the island monitoring. Both observers should be capable of identifying all likely island bird species by sight and sound and should be of roughly equal ability. Field guides and tapes of bird sounds (including songs, half-songs, and call notes) should be studied before hand and intensive training should occur as outlined in Kepler and Scott (1981). For example, potential observers are strongly advised to spend time wandering through similar habitats, either on the island or on the mainland, in order to familiarize themselves with avian behavioral cues. Both observers should conduct a series of simultaneous test counts in multiple habitat structural types before or after the official counts to provide an index for correcting differences in observer bias. An effort should be made by Channel Island National Park to have the same observers conduct the same part of each count over several years to simplify between year comparisons of the count data. If this is not possible, new observers should conduct a series of simultaneous test counts with the observers they are replacing to provide correction indices for differences in observer bias.

F. SCHEDULE FOR COUNTS

Counts should be made during the following time periods.

- Breeding: Late March to first week in April
- Non-breeding: Mid to late October

During unusually dry years, spring counts must be conducted at an earlier date (three to four weeks earlier) in order to ensure that land birds are breeding. Counts during the non-breeding period should be undertaken no later than one month after the recommended time because of the confounding factors of weather-related mortality and weather-related delays during the count period. Observers should allow 9 consecutive days to conduct a complete island count.

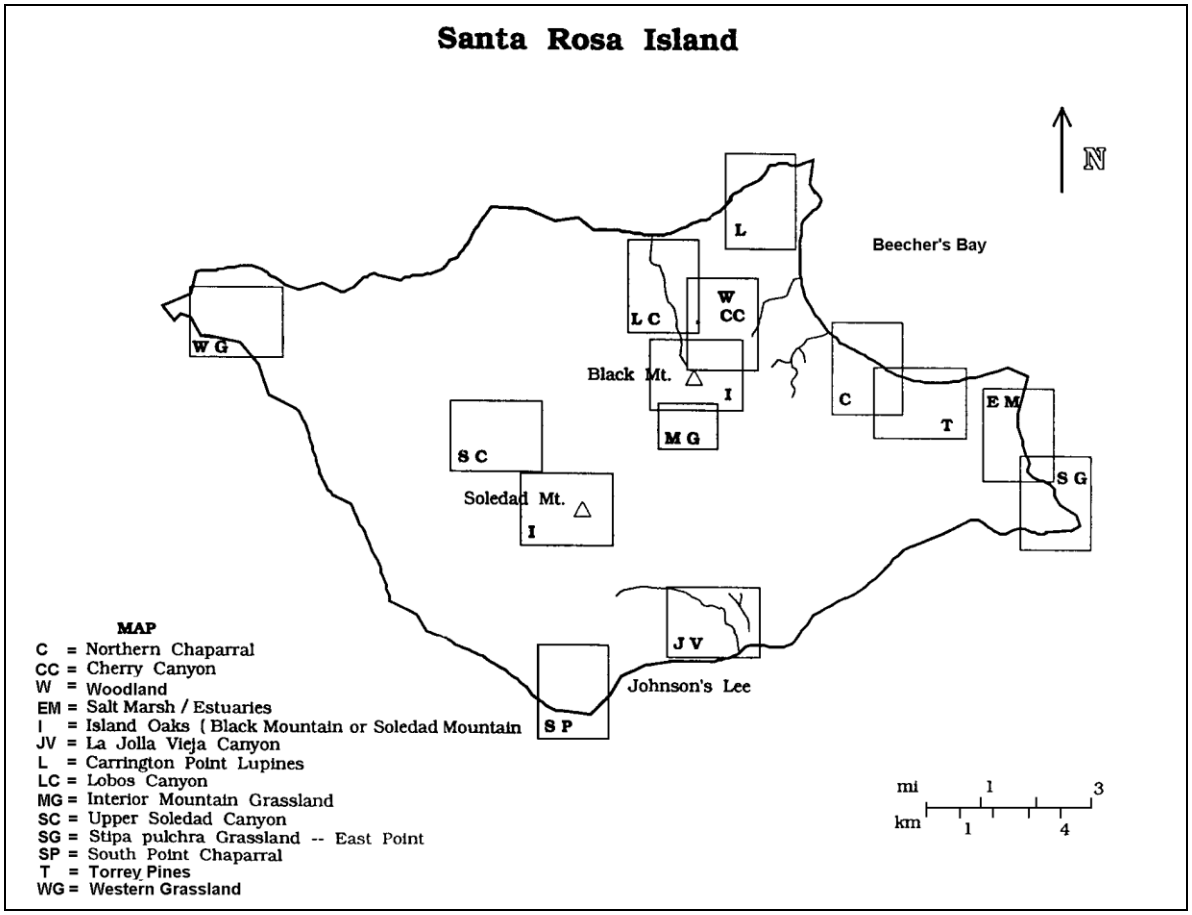
V. DIRECTIONS TO TRANSECT AND COUNT STATION LOCATIONS

The following section contains directions for finding the land bird count stations on Santa Rosa Island, Channel Islands National Park. All compass bearings have zero (0) declination compensation. These directions were last updated during the last week of March, 1990. Some of the landmarks used for these instructions are vegetation or game trails and will most certainly change over time as land-use practices on the island change. For this reason it is important that observers make note of changes as they occur and update these printed directions on a periodic basis.

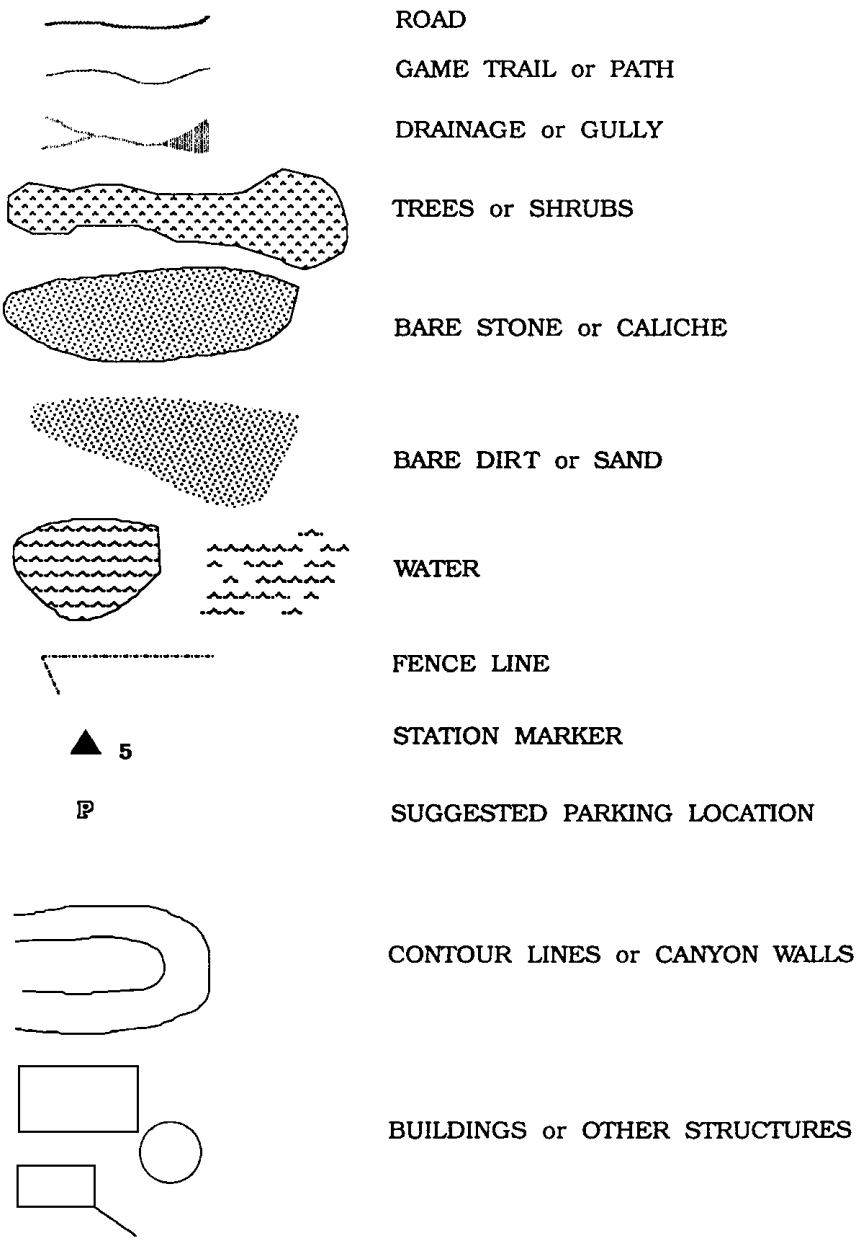
Maps printed on transparencies are provided which can be used with aerial photos to assist observers with finding the stations. Not all topographic or vegetative features are included on these maps and they may also need to be updated as the island changes, or as future observers find other landmarks that prove to be more useful in the location of the station. We hope that these will better allow the observer to visualize the directions and relative positions of the stations.

Even with these maps and directions kept up to date, it is often difficult to find the station markers, even for observers who have visited them on previous counts. The rebar blends in with the vegetation and may be knocked over by storms or animals. It is strongly advised that each observer visit the stations he or she will be counting on the afternoon before they will be counted, to reduce the waste of valuable time spent trying to find a hidden station marker.

The transects are grouped into numbered units, each unit being the most stations that can be counted during one morning, taking into account travel time by foot between stations and by vehicle between transects. These units can be done in any order, depending on what is most convenient at the time.



MAP LEGEND


ROAD
GAME TRAIL or PATH
DRAINAGE or GULLY
TREES or SHRUBS
BARE STONE or CALICHE
BARE DIRT or SAND
WATER
FENCE LINE
5
STATION MARKER
P
SUGGESTED PARKING LOCATION
CONTOUR LINES or CANYON WALLS
BUILDINGS or OTHER STRUCTURES

[1]

Lupine Transect: Carrington Point

Park in the sandy blow-out just before the start of the lupines. Observer #1 starts at L -O1. Observer #2 starts at L -20, but must wait at the vehicle until observer #1 finishes L -02 before proceeding along the dirt road towards L -20. The two observers continue to count until they meet in the middle; therefore, stations L -11 and L -12 are at the end of the instructions for both observers and should be counted by whomever reaches them first.

Observer #1:

L-01 follow the fence line west from the double gates to the first wooden crossbar. The station is about 80 m at 18 degrees from this spot, in a small patch of lupines, at the head of the small gully that leads to the northwest. L-01 through L-06 are all in the gray lupine (Lupinus *albifrons*).

L-02 is about 110 m at 45 degrees from L-01, across the road and at the base of the first ridge.

L-03 is about 100 m at 45 degrees from L-02, over the ridge.

L-04 is about 110 m at 55 degrees from L-03, at the top of a lower ridge.

L-05 is about 100 m at 50 degrees from L-04, at the floor of a shallow canyon.

L-06 is about 100 m at 50 degrees from L-05, half-way up the north wall of a shallow canyon.

After L-06 there is a large gap of grass, and a change in direction. L-07 through L-12 are in the dark green lupine (L. *arboreus*).

L-07 is about 350 m at 70 degrees from L-06. Cross over the ridge and across the road, then up the south-facing slope to the scattered lupine patch. It is 27 m at 25 degrees from the road, between where the road and the cattle path form a `V'.

L-08 is about 200-250 m at 310 degrees from L-07, over the rise, into the really flat, sparse lupine area. It is in the open.

L-09 is about 100 m at 80–85 degrees from L-08. The station is just 2 m on the east side of the well-worn cattle trail.

L-10 is about 100 m at 85-90 degrees from L-09.

L-11 is about 100 m at 100 degrees from L-10. The station is 4045 m beyond the first of two cattle trails that you will cross, in a fairly sparse lupine area, about 40 m at 350 degrees from an old salt lick depression. Skunk Point is visible at 112 degrees from L–11.

L-12 is about 200m at 20 degrees from L-11, over the rise.

Observer #2:

L-20 is in the gray lupine (L. *albifrons*) 25 m southeast of the road on a small ridge of lupine about 25 m north of a small gully that crosses the road. This is about 90 m south of a Y-junction in the road; if you reach the Y-junction, you have gone too far (see map).

L-19 is about 200 m at 30–35 degrees from L-20. You will get to the Y-junction in the road at about 100 m. Continue another 100 m into a mostly bare, grassy area with few dark green lupine (L. *arboreus*). The station is about 25 m northwest of the road.

L-18 is about 100 m at 75 degrees from L-19. You will cross the road about halfway between L-19 and L-18. The station is 20 m southeast of the road.

L-17 is about 100 m at 60 degrees from L-18. The station is about 50 m to the southwest of the road.

L-16 is about 110 m at 80 degrees from L-17.

L-15 is about 200 m at 5 degrees from L-16. Cross the road and skirt to the right (east) of the deep, sandy gully up ahead. It is on the top of a small hill. You are now in the gray lupine (L. *albifrons*) again.

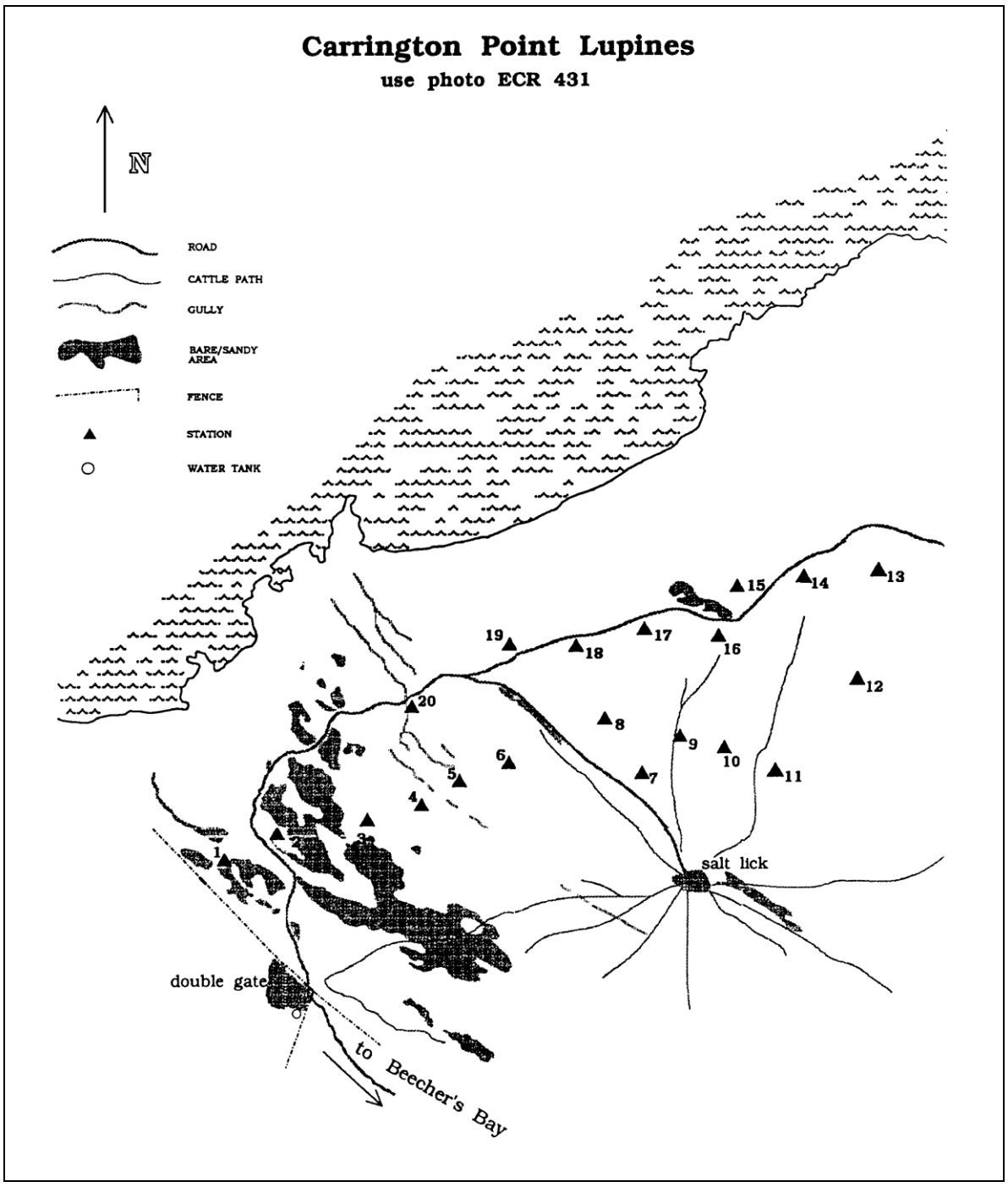
L-14 is about 100 m at 70 degrees from L-15. Cross the road again. From L-15 you can just barely see this station at the top of a rise, about 40 m east of the road.

L-13 is about 150 m at 75 degrees from L-14.

Now change direction and head back toward the dark green lupine (L. *arboreus*).

L-12 is about 200 m at 165-170 degrees from L-13.

L-11 is about 200 m at 200 degrees from L-12. The station is between two cattle trails, in a fairly sparse lupine area, about 40 m at 350 degrees from an old salt lick depression. Skunk Point is visible at 112 degrees from L-11.


Carrington Point Lupines
use photo ECR 431
N
ROAD
CATTLE PATH
GULLY
BARE/SANDY AREA
FENCE
STATION
WATER TANK
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
salt lick
double gate
to Beecher's Bay

[2]

North-facing Canyon Transect: Lobos Canyon

The stations run from north to south, with LC-10 next to the road where it crosses into the canyon. The vehicle should be parked near where the road starts out of the canyon to the east. One observer should start at LC-10 (after waiting five minutes at the vehicle for the birds to settle if the canyon was approached from the west) and head north. The other should start at LC-11 and head south.

Observer #1:

LC-10 is located south of the road crossing, near the large open "turnout" area that is surrounded by large toyon. The station is at the southern edge of the open area.

LC-09 is in woodland, on the east side of the drainage by a rock in a clearing just north of a narrows. It is the first station downstream from the road crossing.

LC-08 is in the streambed, in a wooded area.

LC-07 is in woodland area, up the first large western gully downstream of the road crossing. The station is on the southwest side of the open glade.

LC-06 is in open scrub/bare, near a jumble of dead trees and stumps in the stream.

LC-05 is on the west side of the creek, in an area of open scrub/bare. The station is a few meters upstream of a coil of barbed wire alongside a fencepost.

LC-04 is in mixed woodland/coastal scrub. The station is about 5 m up from the stream on the east side, across from a toyon/willow thicket and past a large rock/toyon aggregation. It is also just past a distinctive wave-shaped rock

LC-03 is also in mixed woodland/coastal scrub, but lower down on the east side of the canyon wall, closer to the stream bed.

LC-02 is in the second small clearing in the large willow patch downstream. It is at the eastern edge of the stream bed.

LC-01 is near the northern end of this large willow patch, between two patches of elderberry (the one to the west being very large). It is east of the stream bed in an open, grassy area where the willows thin out.

Observer #2:

LC-11 is the first station heading upstream from the road crossing. The station is adjacent to the stream, near rocks

LC-12 is on the west side of the creek, at the bend, beyond a large outcropping to the right and between small rocks, in scrub, 4 m up from the stream.

LC-13 is at the junction of the first major canyon offshoot that goes to the west. The station is adjacent to the streambed, on the west side, at the junction, in rocks under a toyon. Habitat is large toyon/scrub.

LC-14 is up the left-hand branch, just downstream from an overhanging toyon at the second bend.

LC-15 is on the west side, just beyond the brushy scrub.

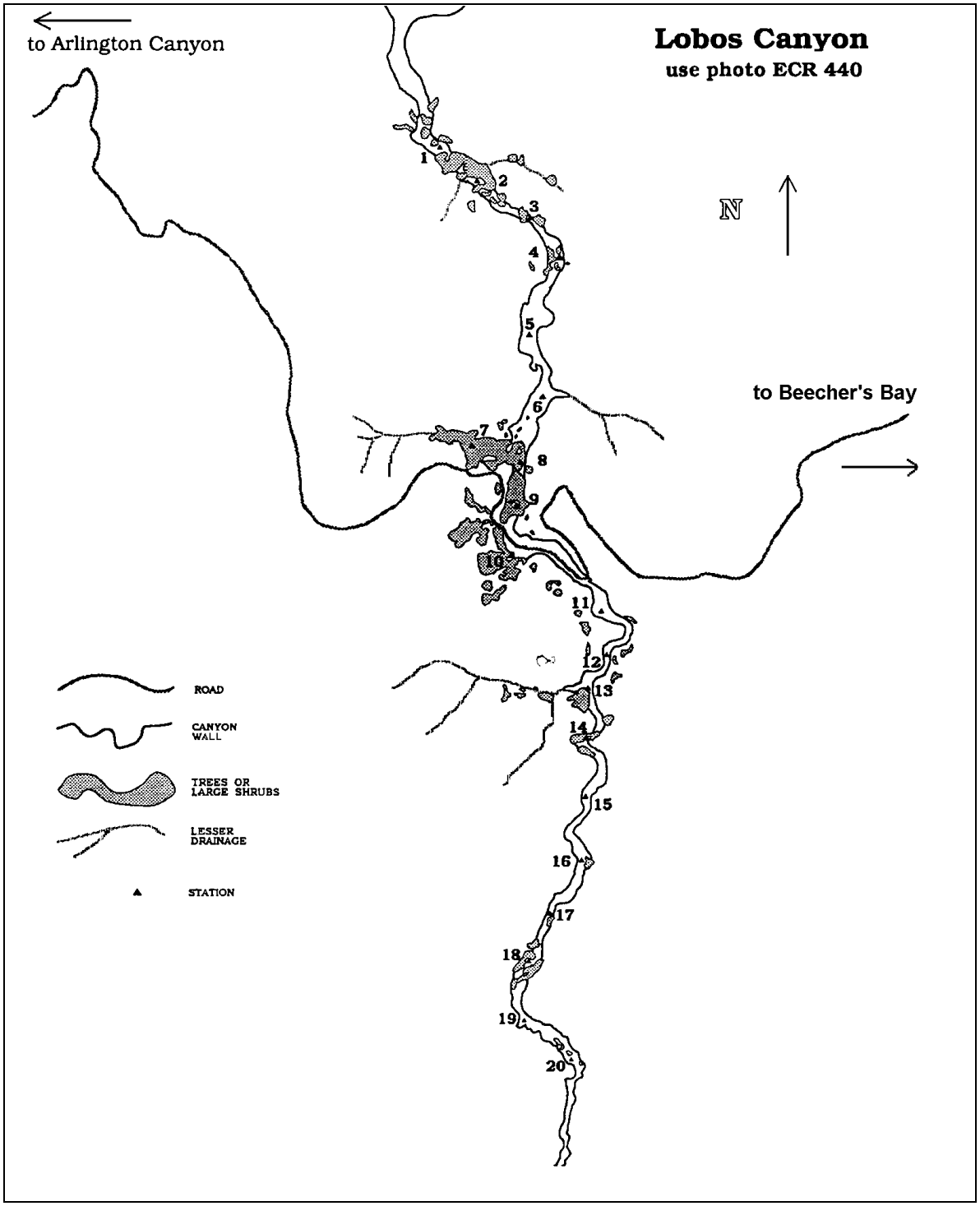
LC-16 is in scrub, adjacent to east side of stream.

LC-17 is at the raised edge of the east bank, in scrub.

LC-18 is on the west side of the stream, just on the east edge of the main cattle trail going through the area. The station is set in a jumble of rocks between a 3 m tall, near a split outcropping with poison oak on top, and a large grove of willows. It is about 15 m along the horizontal from midstream.

LC-19 is on the southwest side of the creek, above the creek bottom, near the large bend in the canyon. The station is located adjacent to the north side of a large rock, right alongside the main game trail.

LC-20 is in scrub, on the west side of the creek just at the lip of the raised little bluff. One must walk about 25 m past a green (lichen-covered) rock pinnacle in the middle of the canyon.


to Arlington Canyon
Lobos Canyon
use photo ECR 440
N
to Beecher's Bay
ROAD
CANYON WALL
TREES OR LARGE SHRUBS
LESSER DRAINAGE
STATION
1
2
3
4
5
6
7
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19
20

[3]

The preferred order for doing this day's transects is as follows:

1. Start with the Mountain Grassland Transects, parking about 50 m north of the paddock (see map). Each observer will do one of the two transects.
2. Drive back to the turn-off for the road to the top of Black Mountain and drop off observer #2. Observer #2 will walk down the road to W-06 and will start the Cherry Canyon Transects from here, proceeding in the order presented below (W-06 to W-09 to CC-01 etc.) and continuing to W-05 through W-01, until meeting up with observer #1.
3. Observer #1 will walk to the top of Black Mountain and conduct the Island Oak Transects from I-01 to I-07. Observer #1 will then drive to W-06, park, and start counting from W-01 to W-05, until meeting up with observer #2.

Interior Mountain Grassland Transects: Black Mountain

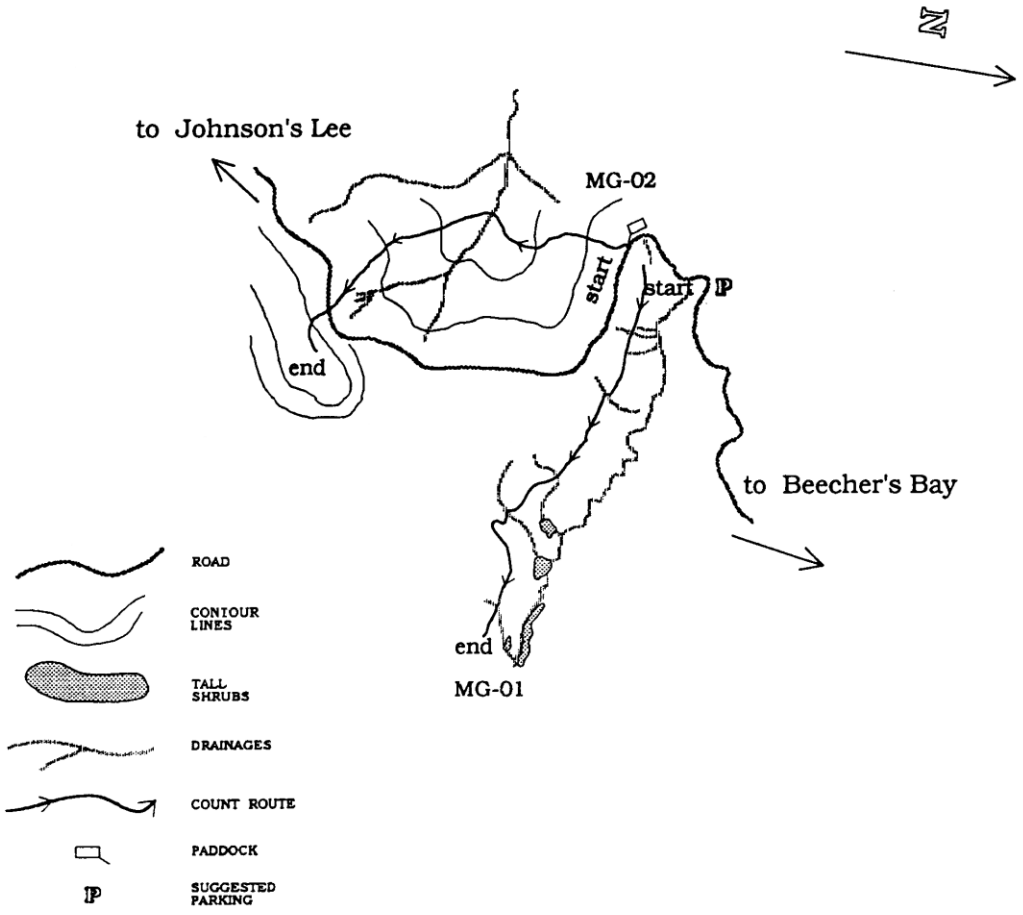
Count all birds seen or heard within a box of space with the following dimensions: a length between you and the end of the transect (therefore always getting shorter; do not count birds that cross into this space after you have passed), a width of 100 m (50 m perpendicular from the trail in both directions), and unlimited height. Make note of the perpendicular distance of the bird to the trail, not the direct distance to the observer. At the end of the transect if you are using a data logger, type `E' then type `A' to reset the time and make note in the comments `END TRANSECT'

MG-01 Follow the very prominent cattle trail running east across the road from the paddock, traversing the north-facing hillside (this trail is visible from the road as one comes down off Black Mountain). The transect starts 150 m from the paddock, the starting point marked by a small, whitish rock and an angle-iron stake in a slight gully uphill from the trail. Continue east on this trail past a large rock 1 m in circumference and just upslope of a small blowout with many Baccharis. The transect ends just as the trail passes through a fairly dense patch of Baccharis. The end of the transect is marked with a small white rock and an angle-iron stake uphill from the trail. 500 m.

MG-02 The transect starts at the easternmost fence post of the paddock (marked by an aluminum tag tied to one of the cross beams). Follow the prominent cattle trail down the south-facing slope and into the bowl below. Where the trail turns west to follow a stream, cross over the stream and continue south cross-country up a gently sloping arm. Near the top of the arm, cut across to the east, cross the road, and climb up to the ridge-top south of the road. The end of the transect is marked by a small rock and an angle-iron stake. 500 m.

Interior Mountain Grassland
South Side of Black Mountain

use photo ECR 485



Cherry Canyon Transects: Black Mountain

Note: Closed-cone pine/mixed woodland/southern riparian are all lumped together in this classification. Stations placed in habitat distinctly of this classification will be labeled as "Woodland" (W - __). When stations are placed in the chaparral habitat in Cherry Creek or its offshoot gullies, the stations will be labeled as "Cherry Creek" (CC - __).

W-01 and W-02 are in the first patch of pines on the west side of the road near Black Mountain. W-03 through W-05 are in the pine patches west of W-01 and W-02.

W-06 is located on the south side of the road at the sharp bend, at the west edge of the pullout area. The stake is pounded adjacent to a patch of scrub. It is in a mixture of habitats, but is the only place where you can get a good feel for this stand of open pine. W-06 should not be flagged, since it is so close to the road that it would be very obtrusive.

W-07 is down the gully from W-06. Cross the road and follow the gully down (north), staying to the left (west) as you get to a large sheer drop-off. Follow one of the game trails which will skirt you past the drop-off and bring you back down into the gully bottom. The station is located about 30 m down from the drop-off, immediately adjacent to the west side of the drainage. The stake is pounded in alongside the west edge a large rock.

W-08 is located on the small knoll north of W-07. Traverse north (down canyon) but slightly up onto the knoll that borders the east side of the gully you are in. Continue walking toward the end of the knoll, and the station is placed next to a large flat rock (about 1 m long) adjacent to exposed rock, in an open area between a couple of pines and an oak.

W-09 is found down canyon, near the end of the knoll, in the next stand of trees, about 20 m up from the junction in the eastern branch-canyon. Before you reach the end of the knoll, turn east and drop about 20 m into the gully. The station is located on the east side of the drainage, right at the base of a trio of oak trees, 10–15 m down from the point where the side gully splits, or halfway between two Y-junctions. The station provides a good view up and down the gullies.

At this point the gully gets very steep and you cannot follow along the bottom. From here, you must traverse up along the east side of the gully, on a path that's about 40 m up from the gully floor, for 150–200 m past the end of the "wooded" area. You will get to a point where a bare rock area extends down across your path, and there is fairly heavy manzanita. At this point, the canyon becomes more gentle. Descend into the gully bottom here.

CC-01 is found in an open area, surrounded on all sides by trees. The rebar stake is on the east side of the drainage, about 3–4 m up the slope from the gully bottom, pounded against a triangular rock on the side of the hill. The station is immediately before the first notably large canopy of trees that overhangs the gully below the point that you descended.

As you continue down the canyon, you will reach an area that is heavily overgrown with tree branches. You must traverse up to the left (west) on a game trail.

CC-02 is located about 25 m up this game trail, on the west side of the gully and adjacent to the east side of the game trail, just below the clump of trees above (west) of the trail.

From here, head up slope, veering to your left (north), to leave the gully and get to the top of the ridge. It is very steep, so be careful. When you reach the top, head north down the ridge until you get to within 25 m of the sharp drop-off at the end of the ridge. At this point head left (west), traversing into the woodland patch in the gully.

W-10 is found near the northern (downslope) end of this woodland patch, on the west side of the drainage, 5 m upslope of the gully bottom. The station marker is pounded against the dirt bank, across from many trees on the east side which lean westward. It is not very visible. Two stakes have been pounded in here, about a meter apart. These stations are probably visible from the ridge that you descended prior to turning west into the current gully. If you reach a 2 m high vertical drop-off in the gully bottom, you have gone too far.

W-11 is up the gully (south) at the base of the large tree that has fallen across the gully. The station is on the east side of the gully, right at the uprooted base of the tree and right before the base of the tall "cliff" in the gully.

CC-03 is located in the middle of the stream bed, on a very small hump. Continue up the gully from W-11, through the large patch of trees and about 8 m past a single lone oak, to the station. Habitat is fairly typical chaparral.

W-12 is located in the next small woodland patch up the gully. The station is on the east side of the drainage, 3–4 m from the gully bottom. The rebar stake is by a small rock outcrop.

CC-04 is reached by continuing up the gully approximately 100 m, to a point where there is a single, twisted gnarled tree in the middle of the relatively open drainage. Go about 15 m beyond, turn left (east), then go about 15 m up the rise. The rebar is pounded into the edge of a small shrub, well below the top of the rise.

CC-05 is about 110 m at 170–175 degrees from CC-04. Traverse over the ridge to a point that is approximately due west of station W-08. CC-05 is located at the edge of a small shrub, in open, sparse chaparral habitat. If you reach the tall chaparral (higher than 1.5 m), you have gone too far. The station is about 20–25 m down (east) of the road.

From here you should continue across the road to W-05 and continue to W-04 and W-03 until you have met up with the counter who started at W-01 and is coming from the other direction. To reach W-05, cross the road and walk north until you come to a wide, bare trench of yellowish rock that descends into the gully to the west of the road, crosses over, and starts up the other side. Follow this path of bare rock over the next ridge to the west and descend into the patch of trees in the closest gully.

W-01 is at the lower portion of the pine stand, on the east side of the gully, approximately 50 m into the pine area and in the middle of the jumbled "blow down" area of dead and live pines.

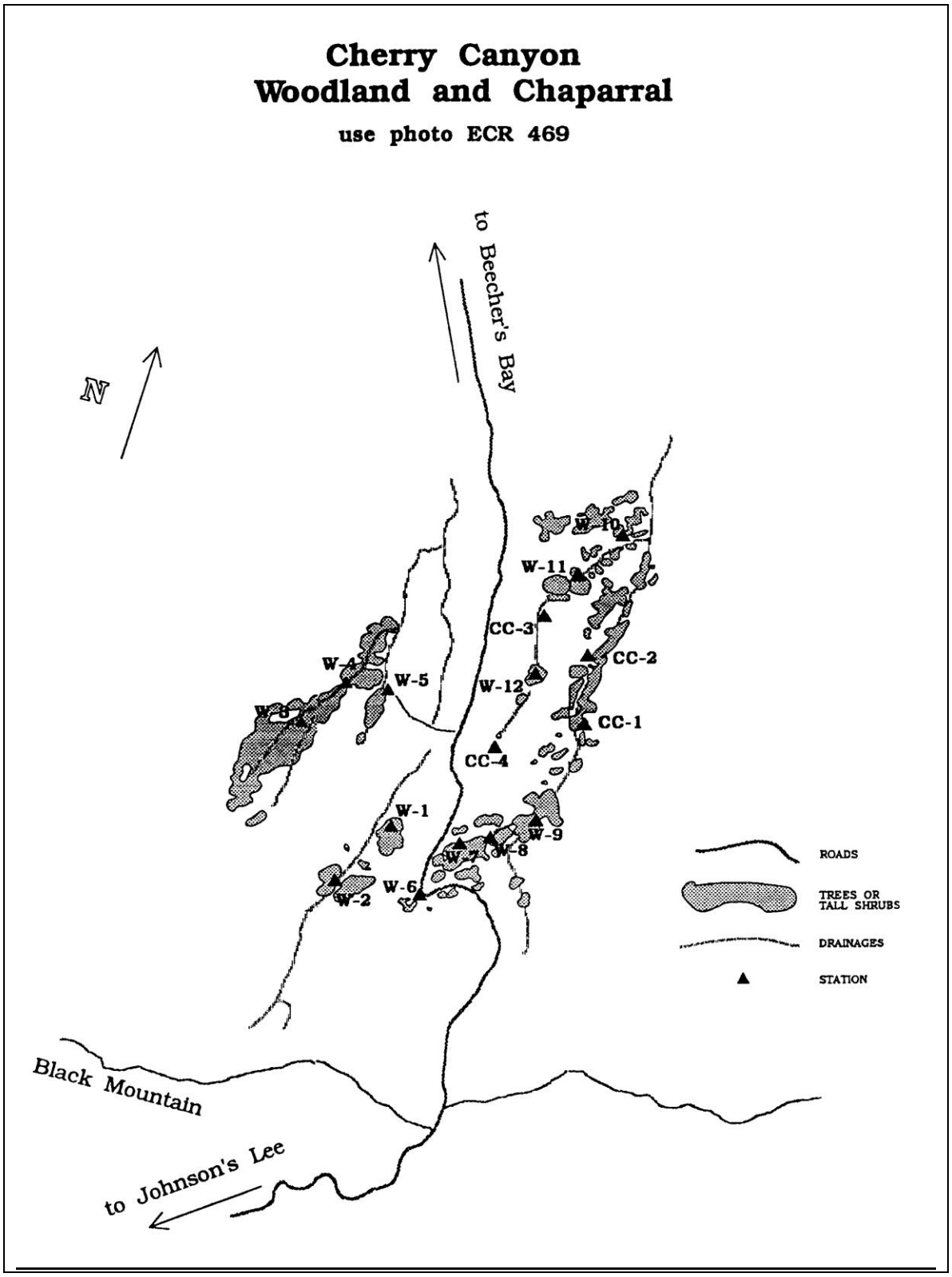
W-02 is located at the upper end of the stand. Traverse along the slope at about the same elevation (or maybe slightly lower) to the small stand of island oaks that abut the pines. The station is located at the east border of the small oak patch, about 4 m upslope from the nearest oaks, at the top of a small rock slab.

From here you will need to cut across the gully and up onto the ridge of chaparral separating this pine stand from the woodland to the west. You must go almost to the northern end of this ridge to find a safe descent into the next wooded gully. This brings you about halfway down the woodland patch, then you must traverse south to the upper end of the woodland.

W-03 is at the upper end of the woodland patch, adjacent to the streambed on the east side of the gully bottom. The station is about 30–35 m downslope from the big rock "wall" and right next to the big overhanging rock in the gully itself that looks like it would make a nice waterfall when it rains.

W-04 is down-canyon, 50 m up-canyon from the sharp bend that joins with the other shorter (eastern) arm of this gully. It is the west side of the gully bottom and about 4 m from the stream bottom, in a very nice "glade" area. The station is pounded adjacent to the trunk of an island oak.

W-05 is in the shorter eastern arm of the gully. The station is located on the east side of the gully, approximately 3 m from the gully bottom and down about 15–20 m from a 2–3 m drop-off in the creek bottom, that would produce a nice cascade during the wet season. The stake is pounded up against the side of an exposed rock on the east side of the slope. This station is a combination of woodland and chaparral/bare (about 50:50).


Cherry Canyon
Woodland and Chaparral
use photo ECR 469
N
to Beecher's Bay
W-10
W-11
CC-3
CC-2
W-4
W-5
W-12
W-3
CC-1
CC-4
W-1
W-9
W-7
W-8
W-6
W-2
ROADS
TREES OR TALL SHRUBS
DRAINAGES
STATION
Black Mountain
to Johnson's Lee

Island Oaks Transects: Black Mountain

I-01 is almost due north of the top of the hill. It is on the east slope of the first large patch of oaks. If you look across the gully to the east, there will be two large solitary oaks spaced about 40 m apart on the ridge. I-01 is across the gully due west of the midpoint between these two trees. The stake is pounded right near the base of a 12 cm DBH oak, northeast of a small patch of Baccharis surrounded by oaks.

I-02 is north, about 100 m down the ridge from I-01. As you head north, just before you get to the end of the ridge, the oaks will get more sparse and the canopy will become much higher. I-02 is here, placed adjacent to a 1 m high stump.

I-03 is west of I-02, over the ridge. Descend into the gully, and as you reach the bottom you will see, on the west side of the gully just above the bottom, a cluster of six oak trunks originating from a single base. The station is located directly across the gully, on the east side, at the base of a burl with three medium-sized trunks (and two thinner trunks branching out to the south). There are wooden stakes placed in the middle of the six-trunk base, and on the east side of the tree where the station is.

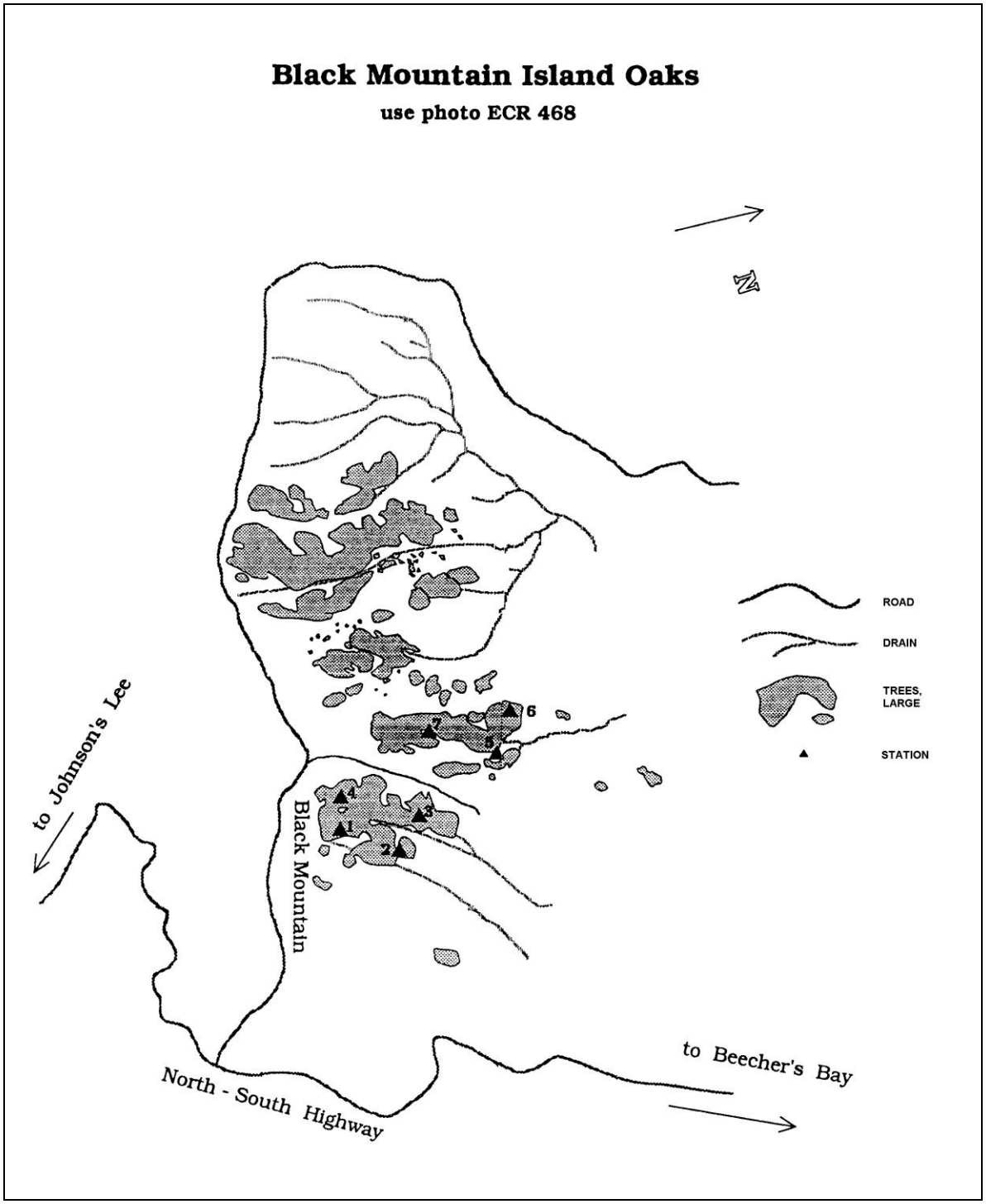
I-04 is found up the gully from I-03. Go up (south) the gully, past the small Baccharis patch in the middle of the drainage and into the main patch of oaks. The station is placed about 25 m up from the Baccharis, and about 4–5 m east of the bottom of the drainage. The stake is pounded alongside the west base of a large oak growing a few meters from the bottom of the gully. Wooden stakes are placed on the east side of the tree.

I-05 is located over the ridge to the west of I-04, in the very small patch of island oaks. Head up to the top of the ridge, cross the road, then proceed north down the very steep ridge that borders the west side of the small oak patch and the east side of a much larger oak patch. Follow the ridge almost to the very end, where you will find a small clump of oaks. The stake is pounded into a small shrub just before the last clump of oaks. The strip of oaks itself was too small for a station, so this station encompasses the small patch to the east and part of the larger patch to the west.

I-06 is almost due west of I-05, in the large clump of tall oaks on the west side of the deep gully (the northernmost oaks of this large patch). You must make your way there as best you can, probably by following game trails that switchback into and out of the gully. The station is placed toward the middle of this tall clump, on the north-facing slope and at the base of a 4–5 m tall dead oak bole (15 cm DBH). There are also three wooden stakes about the base of the bole.

I-07 is south of I -06, toward the top of Black Mountain. Traverse south, making your way gradually upstream to the bottom of the gully, to the point where the drainage splits into two branches. Climb up the short steep ridge that separates the two branches, and find the small clearing. I-07 is located in this clearing just above the splitting of the two branches, between the forks of a small, fallen, dead sapling.

Stations I-08 through I-10 are on Soledad Mountain and are done another day.


Black Mountain Island Oaks
use photo ECR 468
N
ROAD
DRAIN
TREES, LARGE
STATION
1
2
3
4
5
6
7
to Johnson's Lee
Black Mountain
North - South Highway
to Beecher's Bay

[4]

The preferred order for doing this day's transects is as follows:

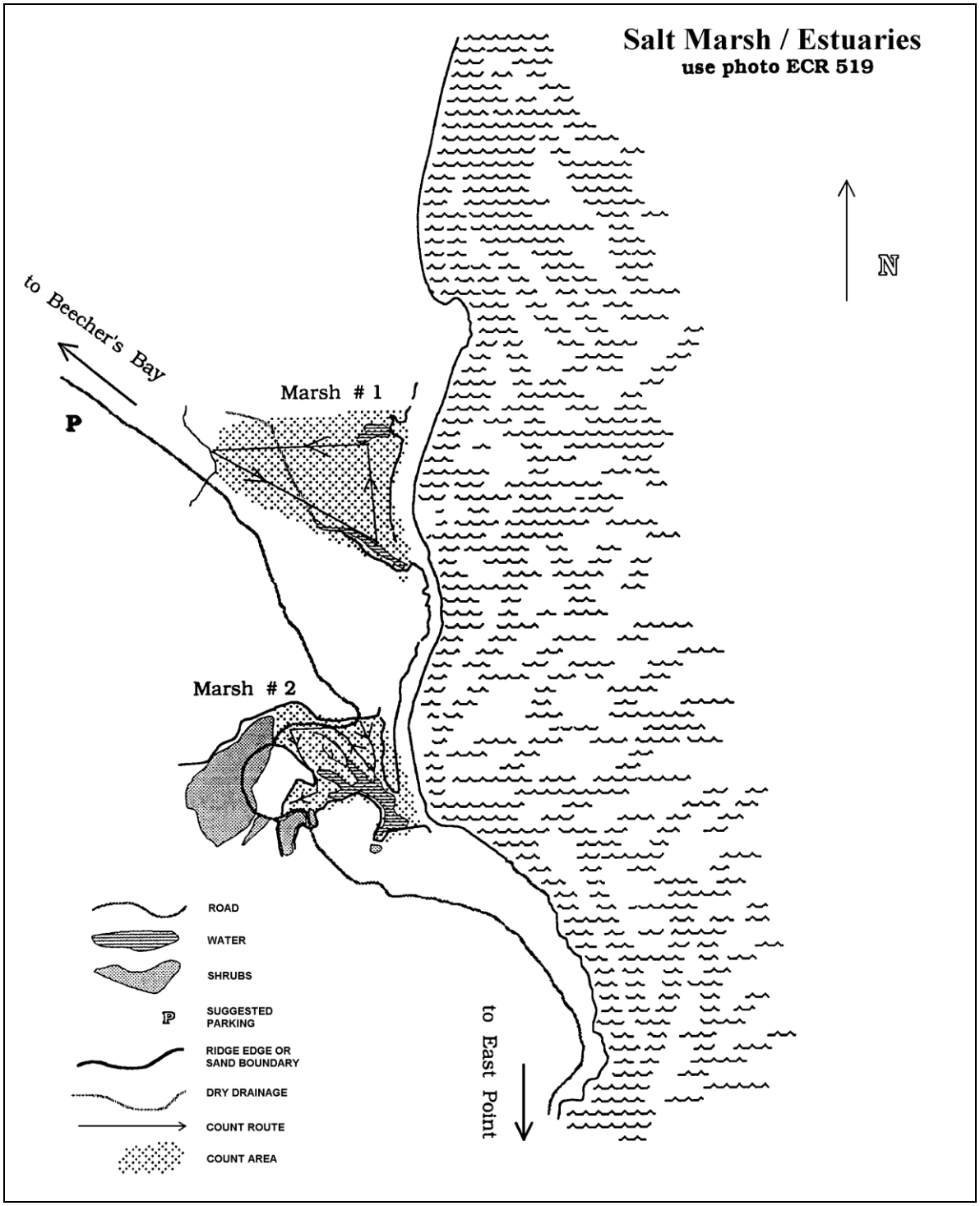
1. Drive to Estuary/Marsh Transects, parking about 20 m before the road passes the cairn for EM-01. Observer #2 will start EM-01. Observer #1 waits for 5–7 minutes then continues to a parking area about 30 m before the road descends into the second marsh and starts EM-02. Both observers meet back at the vehicle here.
2. Drive towards East Point, parking where the road first crosses into the Stipa *pulchra* grassland. Each observer does one of the two Stipa *pulchra* Grassland Transects. The observer doing SG-02 must wait until the other counter has crossed the gully before climbing up to the station's start.
3. Drive back to the Torrey Pines, taking the road that passes above the top of the pines. Observer #2 is let off here to conduct the Torrey Pine Transect, starting at T-02 and ending with T-10 and then T-01. Alternatively, observer #2 can be let off at the bottom of the Pines, below T-01, and proceed in numerical order. Observer #1 drives on to where the road enters chaparral before descending to the marine terrace and conducts the Northern Chaparral Transect. Both observers meet at the bottom of the Torrey Pines.

Estuary/March Transects

Count all birds seen or heard within a box of space with dimensions defined by the map and with unlimited height. The path you are to follow through the marshes is a method for standardizing how you cover the count. Enter '0' for all distances, they are meaningless here. Count all birds that fly over during the time you are conducting the count. At the end of the transect, type 'E' then type 'A' to reset the time and make note in the comments 'END TRANSECT'.

EM-01 Start at the cairn on the low ridge and scan for ducks and whatever else is visible. Walk 249 m at 95 degrees towards a white rock near the southern edge of the two pools, counting ,any birds in the marsh or on the pools that flush as you approach. Scan the pool for all remaining water birds. Proceed due north for 71 m toward the white rock near the northern pool, again counting as you walk. Scan this pool completely, then return 237 m to the starting cairn at 240 degrees, counting as you walk. Total distance = about 500 m.

EM-02 Start as the road enters the marsh grass and count as you walk. Proceed south out along a salt pan to the tip of this peninsula, then turn back and follow the edge of the estuary water north and then west as far as the first Baccharis. Cross back around the high promontory that juts east into the marsh. Walk east to the edge of the water, then return west to the edge of the Baccharis. Total distance = about 500 m.


Salt Marsh / Estuaries
use photo ECR 519
N
to Beecher's Bay
P
Marsh # 1
Marsh # 2
to East Point
ROAD
WATER
SHRUBS
SUGGESTED PARKING
RIDGE EDGE OR SAND BOUNDARY
DRY DRAINAGE
COUNT ROUTE
COUNT AREA

Stipa pulchra Grassland Transects: East Point

Drive to the field of Stipa *pulchra* west of Abalone Rocks and park where the road first enters the grassland.

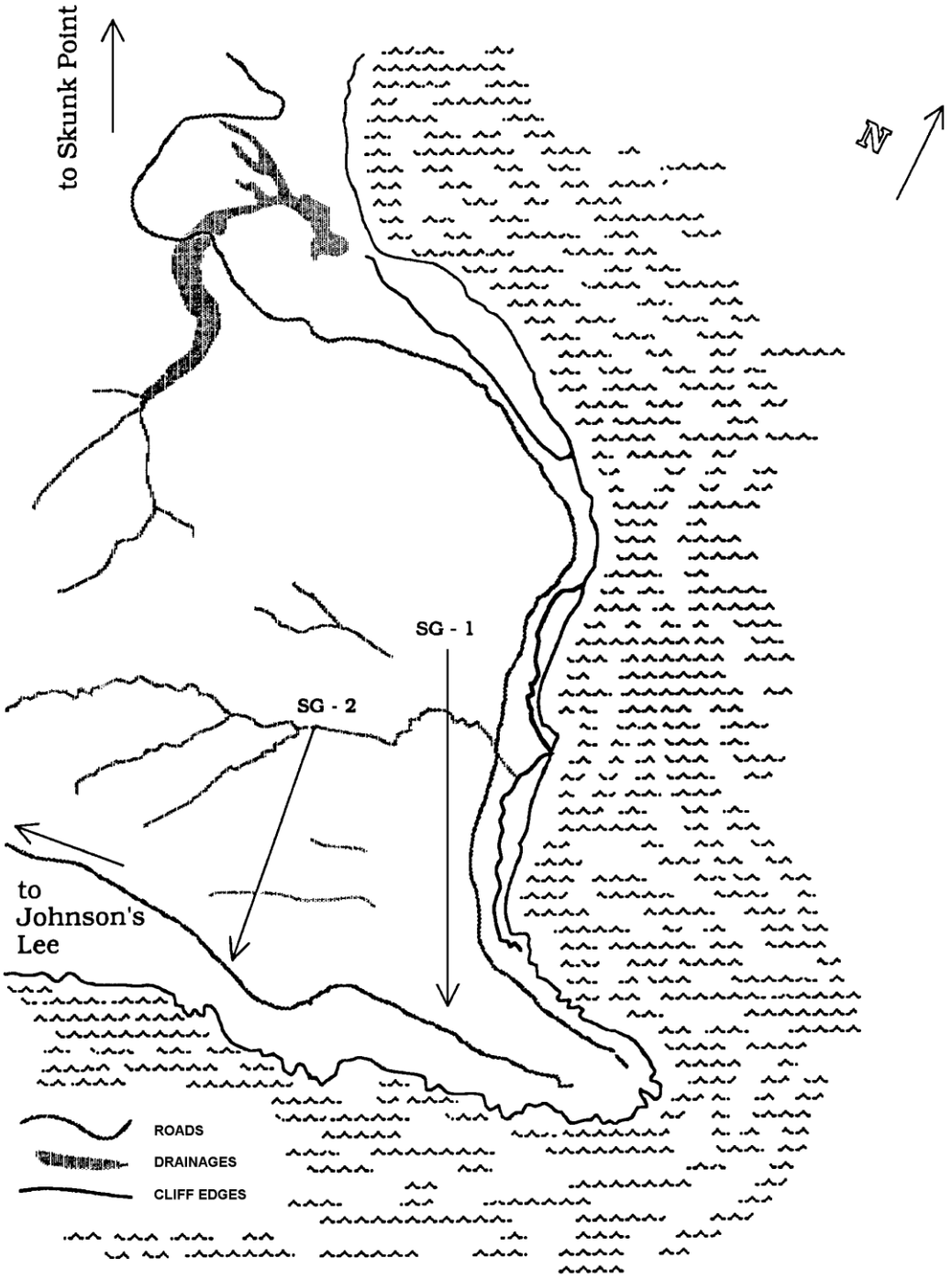
Count all birds seen or heard within a box of space with the following dimensions: length between you and the end of the transect (therefore always getting shorter; do not count birds that cross into this space after you have passed), width of 100 m (50 m perpendicular from the trail in both directions), and unlimited height. Make note of the perpendicular distance of the bird to the trail, not the direct distance to the observer. At the end of the transect, type ‘E’ then type ‘A’ to reset the time and make note in the comments ‘END TRANSECT’.

SG-01 Walk west about 120 m to the Baccharis patch near the base of the hills at the north end of the terrace. The start of the transect is marked by a cairn of white stones at the southern edge of this Baccharis, not easily visible from the road. The transect runs at an azimuth of about 155 degrees towards a medium-sized rock low on the slope of the ridge which runs along the southern edge of the terrace. The end of the transect is marked by this rock. One can sight on this rock, which is only just visible from the start, or on the middle of the lowest "peak" of this ridge. Distance: 600 m.

SG-02 This transect follows the top of the ridges to the west of the terrace. Wait until the person walking SG-01 has crossed the major gully, then climb up to the cairn of whitish rocks near the top of the north-facing side of this gully west of where the gully emerges onto the terrace. The start of the transect is marked by this cairn, which is across the gully and above a large, round whitish rock on the south-facing side. Walk to the top of the ridge and take a bearing on the lone lemonade-berry tree (Rhus *integrifolia*) at the southern end of the ridge, at about 170 degrees. The end of the transect is marked by this tree, but do not count any birds in the tree itself. Distance: 400 m.

Stipa pulchra Grassland
East Point

use photo ECR 522



Torrey Pine Transect

This transect is best started from the top of the ridge above the pines with T-02. T-10 and T-01 can be reached best by descending towards the road (north) in the vicinity of T-02, as described at the end of this section.

T-02 is about 10 m east of a massive pine in a large stand near the western extent of the pines. It is clearly visible when walking along the top if you skirt the bare area at the edge of the stand.

T-03 is reached by heading northeast to the next patch of pines. Go to the head of the third gully (the easternmost of the three branches). On the west-facing slope of this bowl, you will see two large wind-bent pines. The station is located directly across the gully from these, on the east-facing slope of the bowl. The rebar is pounded in the middle of a scrub area, directly below one of the main game trails. It is five meters uphill from a single four-meter tall pine, at about the same elevation as the lower of the two wind-bent trees. Overall, it is about 15–20 m above the gully bottom.

T-04 is northeast toward the next gully system. Bypass the very first small gully that you come to, a short distance out along the plateau. The station is located in the next (eastern) major clump of pines. There is a flat "ridge" that extends north a short distance then drops steeply (not the one covered with prostrate chaparral). Just over the rocky lip of this drop is one very large pine. The rebar stake is pounded into the rock at the western base of this tree. There is also a wooden stake strapped to one of the low branches that extends above the drop-off. Walk along the edge of the pines until you see this tree.

T-05 is found north along the ridge. Continue down the ridge, through the area where the slope gets a little steeper to the point where it almost drops straight down at a rock face. The rebar stake is at the base of a four-meter tall pine with a 20 cm DBH at the top of the rock face.

T-06 is southeast, across three gullies to the rise following the third gully. You will be on a fairly narrow ridge that extends northward. About 70–80 m from the top (southern end) of the ridge, you will find a 7–10 m high pine that has a distinctive shape. The trunk extends straight up for about 4–5 m, then bends sharply at a 45 degree angle to the southeast. The rebar stake is driven right at the south base of that pine, and a wooden stake is on the north.

T-07 is farther down the ridge. Continue north down the ridge through an open patch of very short (a few inches tall) chaparral plants. Pass through this and into the small clump of pines directly ahead. Just after you pass into this clump of pines you will reach another smaller open area of chamise and grass surrounded by more pines and some scrub. The rebar is pounded at the base of a small (20 cm DBH) pine that is growing at an angle to the north, at the west side of the clearing. The census itself should be done from the middle of the open area. There will be two wooden stakes in the clearing to mark where the census should be done.

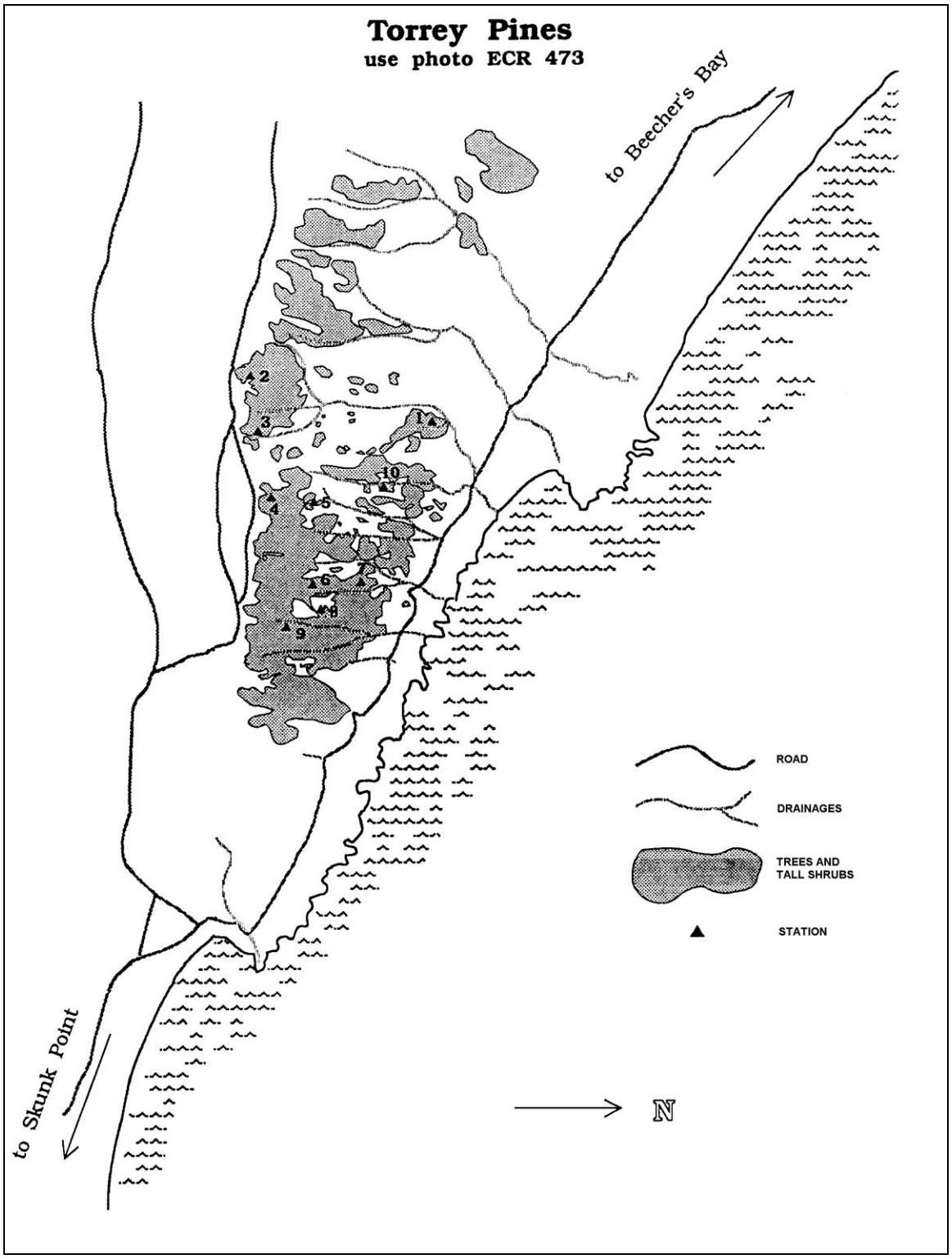
T-08 is two ridges to the east on the lower (northern) section of the ridge. Follow a game trail down across two gullies and onto the second ridge. There will be a series of three open grass/dirt areas. The first one is rather large, the second fairly small (about 25 m diameter), and the third even smaller (about 20 m across in the widest direction and slightly uphill). After the third one, the ridge opens on the north to primarily grassland. The station is in the second of these open areas, next to a single, 2 m tall pine. Two wooden stakes are pounded at its base.

T-09 is up the slope from T-08. Head up the ridge, but stay on the west side of the slope and transverse westerly across a short, shallow gully, then onto a short ridge. The rebar is at the bottom (on the north side) of a single pine that is at the northern edge of a bare/grassy stretch. There are two wooden stakes at the base. T-09 is almost due south of T-08.

After T-09, traverse down the hillside to the road, as T-01 and T-10 are best approached from below.

T-10 is located at almost the opposite end of the pine patch, back toward station T-01. Approach from the road below the bottom of the pines, until you get to the first (western-most) gully that passes through the pines and crosses the road. This is the point where two major gullies converge into one. To get to station T-01, you followed the right (west) branch of the gully. To find station T-10, you must go up the left (east) branch of the gully about 110 m. Go into the pines about 30–50 m (depending on where you draw the boundary of the pines) . You will cross under a large pine that is actually growing across the gully. The station is about 20–25 m from the tree, up the gully, on the eastern slope about 7–8 m from the gully bottom. T-10 is on the eastern edge of a large patch of low scrub, about 7 m downslope from a large pine.

T-01 is located at the northern (lower) end of the western-most Torrey Pine gully. Head up the gully from where the road crosses, until you get to the first side branch that goes to the left (southeast). Go up this left branch about 40–45 m, and the station will be on the ridge to your right (the north-facing slope), at the edge of a bare dirt area next to some old, gnarled manzanita.


Torrey Pines
use photo ECR 473
to Beecher's Bay
to Skunk Point
1
2
3
4
5
6
7
8
9
10
ROAD
DRAINAGES
TREES AND TALL SHRUBS
STATION
N

Northern Chaparral Transect: West of Torrey Pines

Park just before the road enters the chaparral. Start with C-10 on the west side of the road. The rest of the transect starts with C-01 just east (downslope) of where the road (coming from the south) first meets the chaparral.

C-01 is on the east side of the road, downslope, about 5 m south of small gully. The first few stations will be at an azimuth of 100 degrees from a 1.2 m tall scrub oak growing beside and to the west of the road.

C-02 is 110 m at 100 degrees from C-01.

C-03 is 100 m, 100 degrees from C-02, at the edge of dense, chaparral shrubbery. The station is about 10 m west of the barbed wire fence.

C-04 is 200 m from C-03, roughly east across a barbed wire fence, over the fairly barren ridge, and down into the deep gully on the east side. From the top of the ridge you can look down into the ravine and see a point where four gullies meet to form the major gully. The station will be on the north-facing slope of the small ridge that separates the eastern most gully from the other three. It is about 25 m up from the junction of the gullies, and the stake is pounded next to a small shrub.

From here, turn north and go down the gully, staying on the east side. Traverse about 30 m up from the bottom of the canyon, staying a little downslope of the ridge to your right. You will pass a short chaparral patch, followed by a group of tall manzanita.

C-05 is located near the patch of manzanita, on the east slope of the gully, about 30 m up from the bottom. The station is about 10 m up from the edge of the patch of tall manzanita, surrounded by prostrate manzanita. It is roughly 120 m north of C-04.

C-06 is about 100 m north of C-05. The station is located next to a large (0.6 x 0.3 m) rock, toward the end of the ridge and about 8–10 m east of a steep drop-off in the gully. For a rough approximation of the location, take a bearing on the cliff (with many holes in it) on the west side of the gully. It is at 310 degrees from the station.

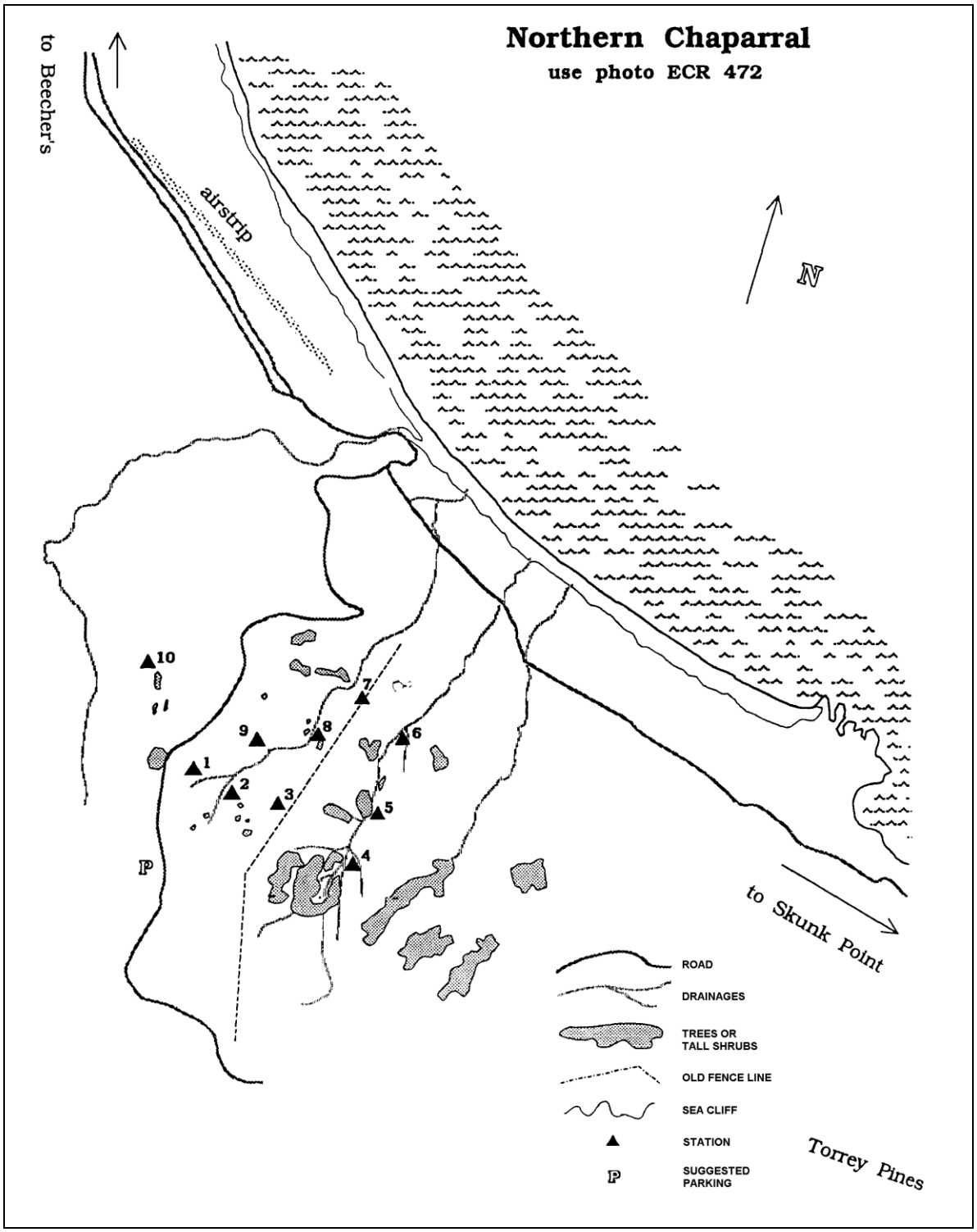
C-07 is approximately 310 degrees from C-06. Cross the gully and go across the barbed wire fence. Crossing the gully is a little tricky as it is very steep (expect about 6–8 minutes transit time between C-06 and C-07). Once at the fence, find the closest pair of old wooden fence posts that are about 3 m apart. Head about 15 m at 300 degrees from the fence posts. The station is in the middle of a small shrub.

C-08 is over the rise to the south. Head at an azimuth of about 200 degrees. Continue 50 m past the small ridge encountered at about 50 m. The station is between two clumps of oak: one, a large clump of trees that extends up a small side gully, and the other, low shrubs on more level terrain. The station is right at the top of a small rock outcropping.

From C-08, you will see a large rock (about 1 m high) at the end of a small ridge/point at an angle of 230 degrees. Head toward this rock, which is about 10 m from C-08. From the rock, site along 300 degrees to the one twisted manzanita "tree" that sticks out above the surrounding shrubs.

C-09 is located about 5 m south of the base of this manzanita. From here, you can triangulate on several other stations: C-08 is at 70 degrees; C-02 is about 100 m at 160 degrees; C-01 is about 100 m away at 220 degrees.

C-10 is west of the road from a tall scrub oak near the road. Head down along the ridge in a northwesterly direction. The station is in an area of chamise crisscrossed by numerous shallow, bare gullies and paths, past some low scrub oak. It is about 180 m at 300 degrees from the top of the nearby promontory.


Northern Chaparral
use photo ECR 472
to Beecher's
airstrip
N
to Skunk Point
Torrey Pines
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ROAD
DRAINAGES
TREES OR TALL SHRUBS
OLD FENCE LINE
SEA CLIFF
STATION
SUGGESTED PARKING

[5]

The preferred order for doing this day's transects is as follows:

1. Drive to Pocket Field, arriving less than 15 minutes after sunrise (this is best accomplished if the observers spend the night at the cabin in Arlington Canyon. Each counter does one of the two Western Grassland Transects. If necessary, there is time to wait an hour for fog to clear.
2. Drive to Upper Soledad Canyon along the Signal Road. Park to the northeast of the road just before you come to the plateau with the side road running north. Observer #1 will start at SC-01, observer #2 at SC-10, both continuing to do stations until they meet in the middle.
3. Continue along the Signal Road to where it connects with the Cross-Island Road. Turn south onto this road. Drop observer #2 off at I-08. Observer #1 continues south and will count I-09 and I-10.

Western Grassland Transects: Pocket Field

Drive to Pocket Field. Park at the western end of a large caliche patch.

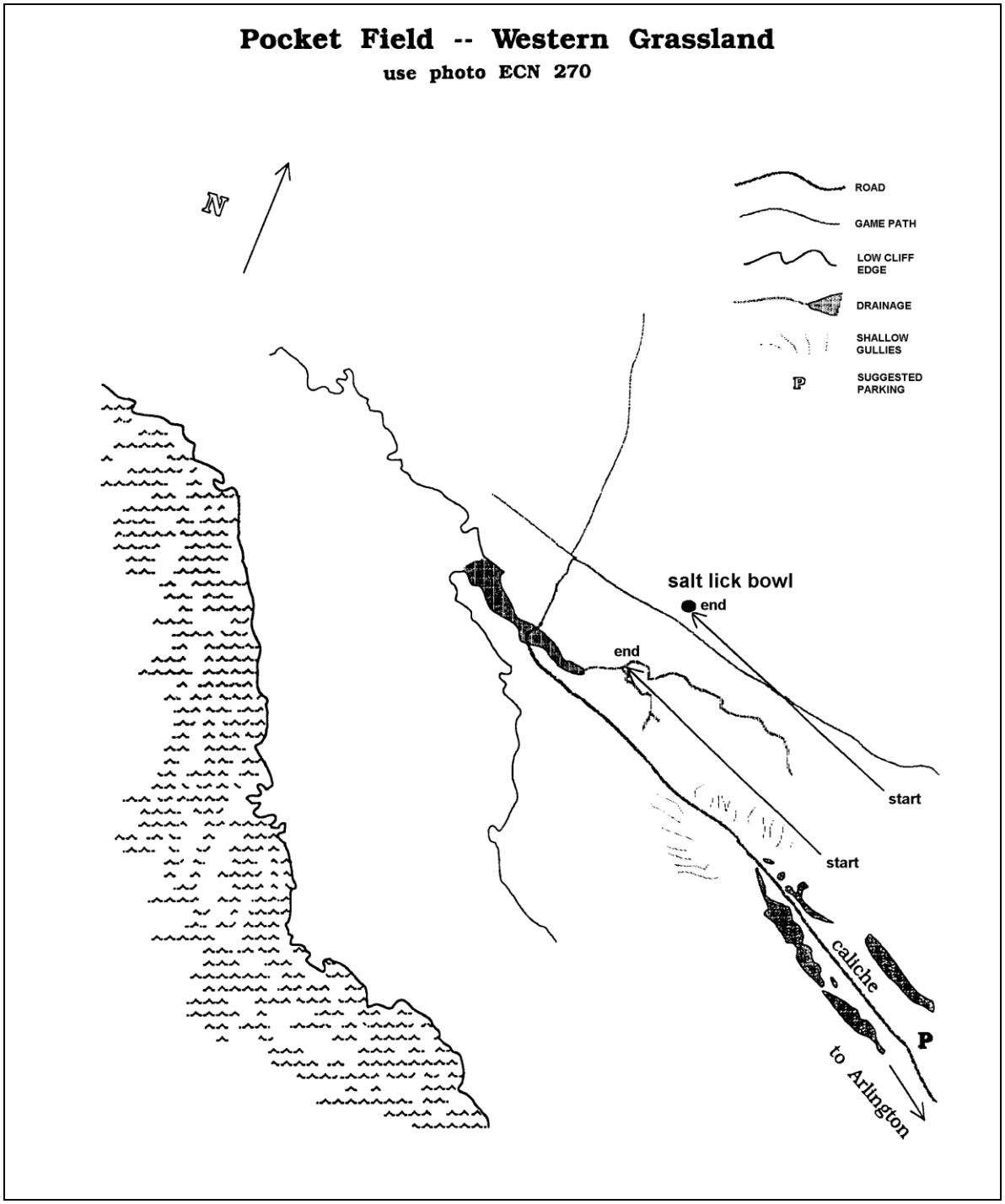
Count all birds seen or heard within a box of space with dimensions: length between you and the end of the transect (therefore always getting shorter; do not count birds that cross into this space after you have passed), width of 100 m (50 m perpendicular from the trail in both directions), and unlimited height. Make note of the perpendicular distance of the bird to the trail, not the direct distance to the observer. At the end of the transect, type 'E' then type 'A' to reset the time and make note in the comments 'END TRANSECT'.

WG-01 Traverse north across the low plateau you are on and down the orange, eroded gullies. The transect starts at a large rock (bigger than any in the area) on a low mound and runs west from here at an azimuth of 290 degrees. The end of the transect is marked by a cairn of three whitish rocks at the joining of 2 small gullies. You can sight along these rocks and/or the top of Sand Peak as guides to keep yourself walking along the line. Distance: 500 m.

WG-02 The start of this transect is marked by a large, reddish rock which is 200 m at 20 degrees from the starting rock for WG-01. It runs at a azimuth of 290 degrees to an old, bear salt-lick area where the end of the transect is marked by a large, flat, white rock. The transect crosses a pair of little-used road ruts which are included in the count area for the transect's entire length. One can sight on the end rock or on a point a little to the right of the summit of Sand Peak as a guide. Distance: 500 m.

Pocket Field -- Western Grassland

use photo ECN 270



Coastal Scrub Transect: Upper Soledad Canyon

To reach the general area of the stations, follow Signal Road 1.1 miles south from the Smith Highway junction. In this area the road will come in a big loop around a knoll, where a fairly large flat ridge extends north toward Smith Highway. At the east edge of the loop, a small dead end road (shown on map) runs along the east side of the ridge. A well worn game/cattle trail also runs down the middle of the ridge. Park beside the road before you come to this ridge to avoid disturbing the birds.

SC-01 is about 50 m north of the road, on the east edge of the ridge above the canyon and 10 m east of the dead-end road.

SC-02 is about 100 m from SC-01, at 340 degrees from SC-01. The station is also on the east side of the ridge. The stake is in a small clump of Baccharis, just at the beginning of the east-facing slope at the top of the canyon.

SC-03 is about 120 m at 320 degrees from SC-02. This will bring you onto the flat plateau area of the ridge. Cross a large bare area and head into sparse sage scrub. Orient towards San Miguel Island, if visible. Do not cross the little cattle trail.

SC-04 is about 100 m at 335 degrees from SC-03. The station is 10–12 m west of the cattle trail, at the south edge of a 30 m diameter open/grassy area.

SC-05 is 100 m northwest of SC-04, at about 320 degrees, 10 m west of a bare, wallow area.

SC-06 is west of SC-05, at 250 degrees, toward the edge of the gully to the west. At about 130–140 m, you will hit the edge of the south-facing slope with dense sage vegetation. The station is over the edge of the gully, through the sage vegetation, and down at the bottom of the gully. Cross to the south side of the gully, and the station is about 3 m up from the bottom of the canyon.

SC-07 is down-canyon almost due west (280 degrees). Continue down until you get to where the gully you are in junctions with the main gully. The station will be on the west side of the main gully, about 15 m up the small flat arm that extends down into the gully (on the southern edge).

SC-08 is up-canyon from SC-07. Head south up the canyon, staying to the left at the first branch point you encounter about 40 m up from SC-07. Continue to the next branch, about 50 m above the first. The station will be on the west side of the branch point, about 2 m up from the gully bottom.

SC-09 is up the canyon that branches to the east (left). Go up about 90 m into an area of fairly pure sage. The rebar is pounded into the short, almost vertical gully wall on the north side, about 2 m above the gully bottom. It is sticking out from the wall at about a 45 degree angle toward the sky. The actual census should be conducted from the south side of the gully, about 2–3m above the gully bottom. There is another rebar stake painted half orange on the north .side of the gully, half way between SC-08 and SC-09, but it is for some other study and should be ignored.

SC-10 is farther up the gully. Continue up about 110 m. The station is right at the southern edge of the gully, above the fairly sheer gully face, on a small point that juts to the north. The count should be conducted from about 3 m south (up-slope) from the actual station. Note: SC-10, it is not in the branch of the canyon that reaches the road (see map).

Island Oaks Transect: Soledad Mountain

These stations are best done by observer #2 while observer #1 continues on to do stations I-09 and I-10.

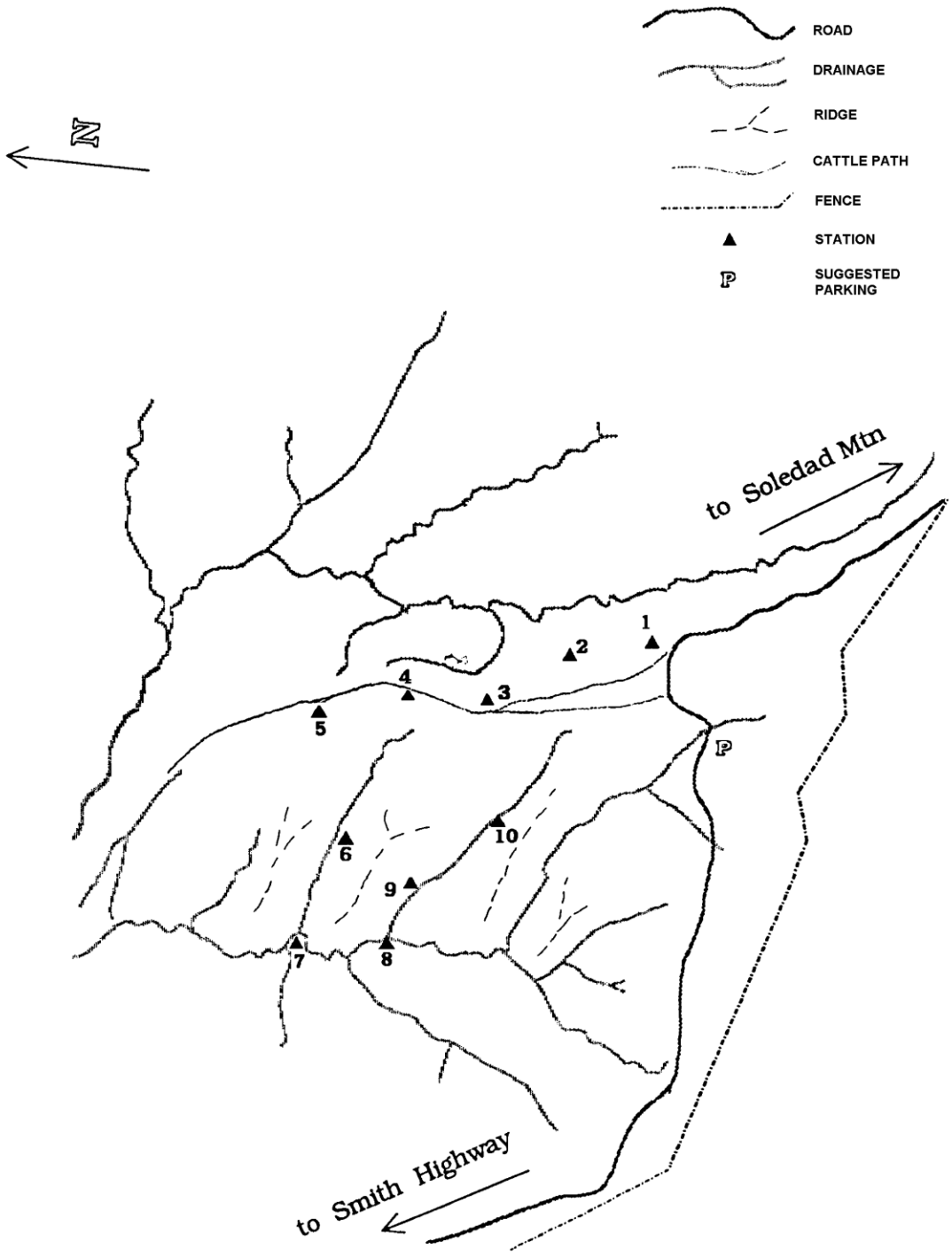
I-08 is in the easternmost of the Soledad Oak patches. The stake is pounded between the roots of one of the oaks, about 50 m in from the northern end of the patch.

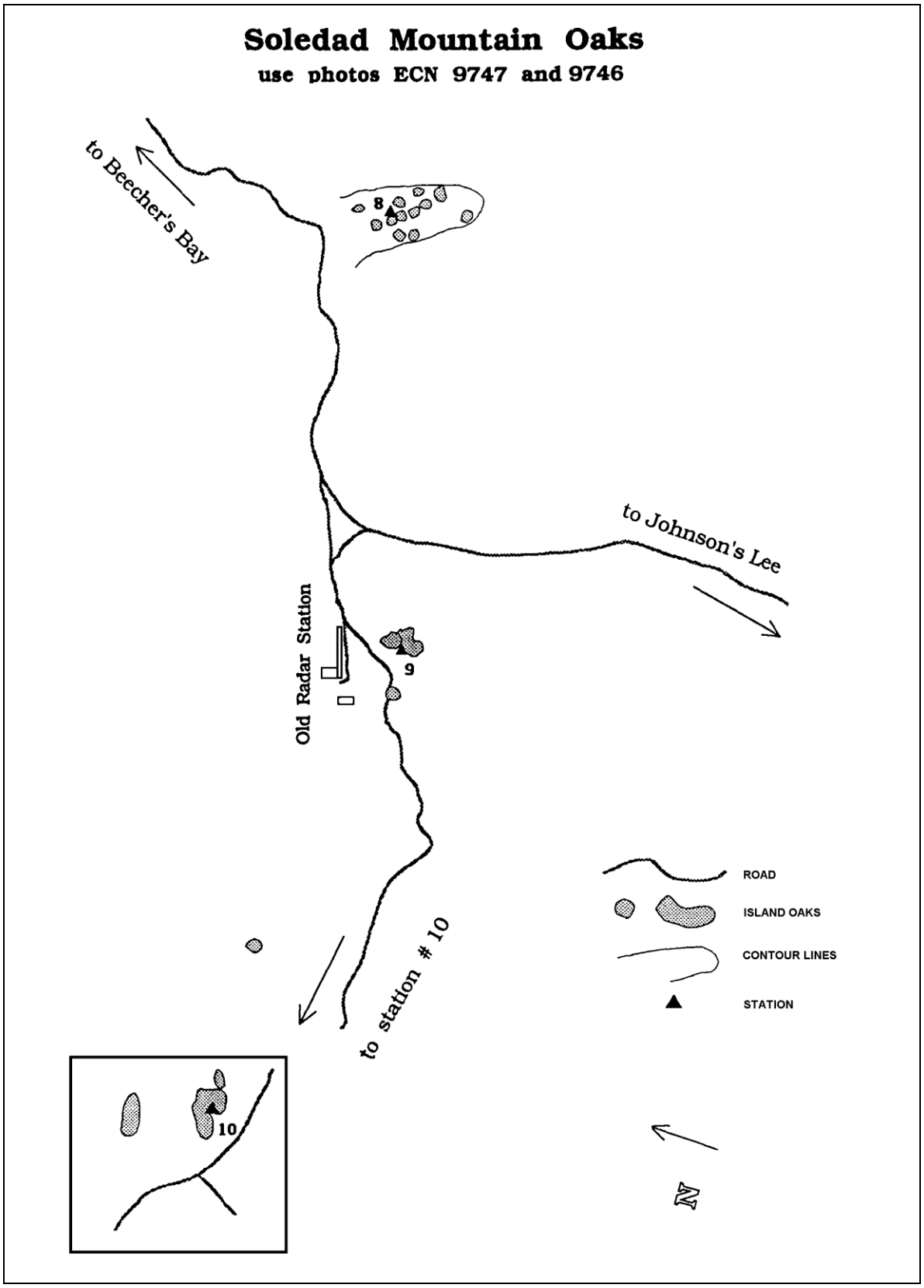
I-09 is in the small patch of oaks south of the radar station. The rebar stake is driven into the bare ground, 50 m west (uphill) of the small oaks at the eastern border of the patch. There are also three large rocks piled at the base of the station.

I-10 is in the small patch of fenced oaks. The station is on the west side of the small bowl/ridge that separates the two small patches of oak.

Upper Soledad Canyon

use photo ECR 463




Soledad Mountain Oaks
use photos ECN 9747 and 9746
to Beecher's Bay
8
to Johnson's Lee
Old Radar Station
9
to station # 10
10
ROAD
ISLAND OAKS
CONTOUR LINES
STATION
N

[6]

Southern Chaparral Transect: South Point Road — Hill 1017

Park at the base of the hill where South Point Road branches off from the North-South Highway and walk up the road to the hill top and the first stations. One observer should start with SP-01 and the other with SP-20 and they should both count until they meet somewhere in the middle. These instructions are designed so that the first 10 are oriented chronologically and the second 10 are oriented from SP-20, reverse chronological order.

Observer #1:

SP-01 is located about 6 m west of the road, near where the road takes the first sharp turn to the left (south) after the junction from the main road. It is visible from the road and is also marked by a rock cairn beside the road.

SP-02 is 100 m at 220 degrees from SP-01. It is on the western edge of a large rock patch.

SP-03 is 100 m at 230 degrees from SP-02. It is found where the hillside becomes somewhat rocky and barren.

SP-04 is up over the rise, at 220 degrees. You will come to a rock-covered ridge, about 100 m from SP-03. The station is among the rocks.

SP-05 is about 100 m at 230 degrees, across a small gully. It is in the chaparral near a small strip of rocks. It is near the intersection of two prominent game trails.

SP-06 is 100 m at 230 degrees from SP-05. The station is at the north edge of a bare area, about 12–15 m north of the road.

SP-07 is about 140 m at 240 degrees from SP-06. The station is over the top of the rise. Look for an open area with a dead tree that leans to the south. It is about 15 m north of the tree.

SP-08 is about 100 m due south of SP-07. Head up the hill at 180 degrees. The station is about 15 m at 310 degrees from a large rock formation on the top of the ridge with a pyramid-shaped, tent-like opening, and about 20 m north of the sharp ridge.

SP-09 is almost due east from SP-08. Head over the ridge at an azimuth of about 80 degrees, through the broken rock jumbles. This station is about 50 m at 120 degrees from the lone tree on the top of the hill.

SP-10 is about 100 m at 100 degrees from SP-09. Head toward a large rock on the horizon (the stake for SP-12 is visible at its base). You will cross the road at about 25 m from SP-09. Continue another 75–80 m.

Observer #1 is to continue on to SP-11 and SP-12 (both at about 100 degrees from SP-10) until observer #2 has been encountered.

Observer #2:

SP-20 is half way between SP-19 and SP-01. It is about 20 degrees from SP-01 and about 220 degrees from a large, hollow rock on a promontory northeast of the road.

SP-19 is about 15–18 m northwest of the road, at the edge of the grass/chaparral interface. The station is at the top of a small ridge, almost at the summit of the hill, and is visible on the walk up the road.

SP-18 is about 110 m at 30–35 degrees from SP-19. You will cross the road at about 65 m. The station is on the east side of the road, between two curves of a Z-shaped jog, and about 110 m at about 160 degrees from SP-01.

SP-17 is about 120 m at 20 degrees from SP-18. You must cross over the knoll and down the other side. The station is just north of a very small clump of tall shrubs and is roughly 180 degrees from SP-01.

SP-16 is about 100 m at 160 degrees from SP-17, about 65 m west of the next ridge. It is on the edge of a ridge that extends down the eastern arm of the hill, at the border of a fairly rocky area.

SP-15 is about 100 m at 155 degrees from SP-16, around the edge of the hill, and at about the same elevation as SP-16. The station is located about a meter southwest of a 1 m high hollowed-out rock (though the hollow is only visible if you pass the station or are too low on the hillside).

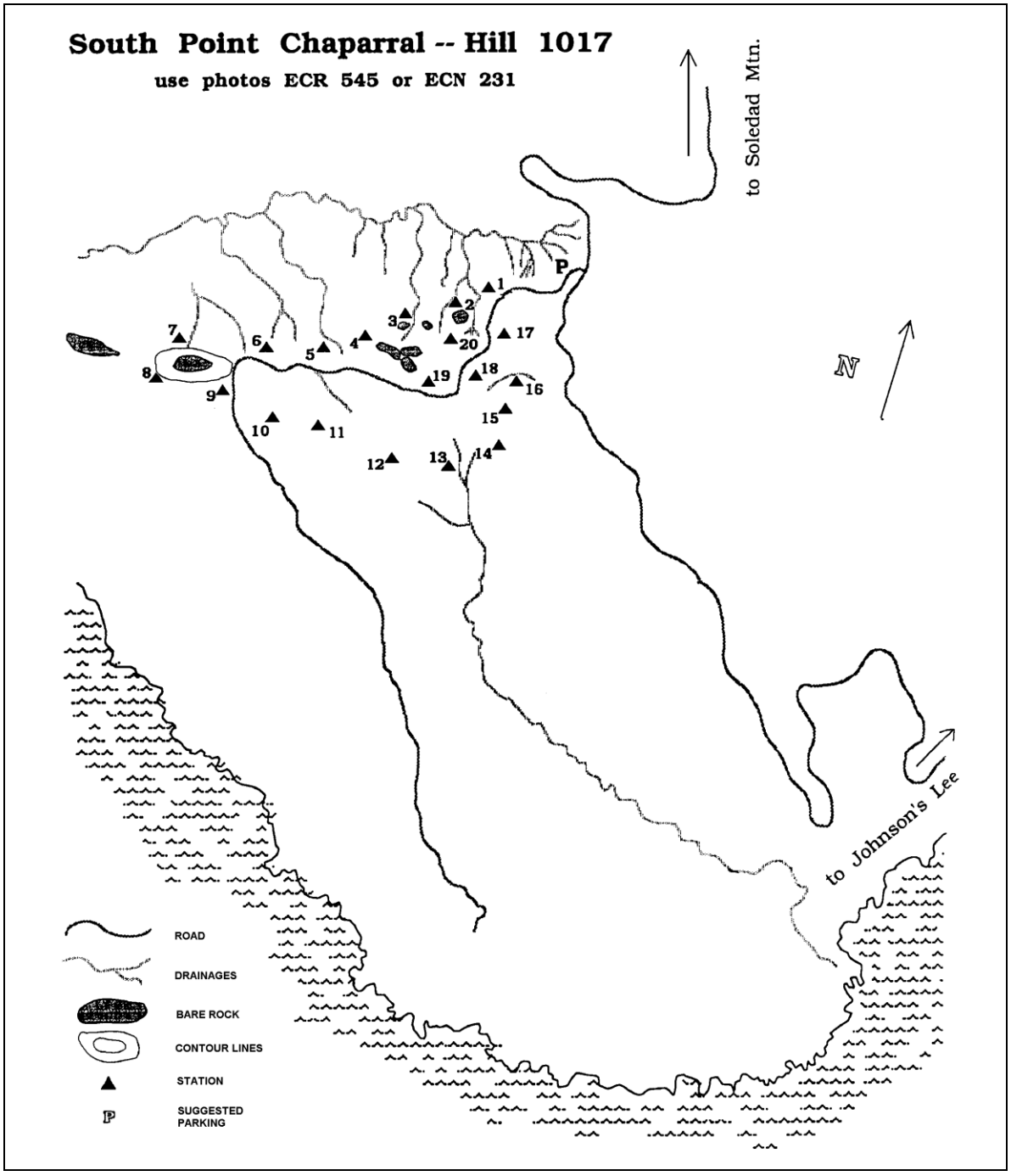
SP-14 is about 100 m at 160 degrees from SP-15 and is located just on the southern edge of a ridge among a pile of rocks.

The next station will be across the large deep gully in front of you. To reach that station, you should go up to the ridge you are on, over to the top of the next ridge, then down. Do not try to go down and across the gully as it is very steep and this would be very time-consuming.

SP-13 is about 100 m at 220 degrees from SP-14 on the east side of the ridge you have now come down on. You can orient on rocks at about 50 degrees across the gully to the east. One has an oval-shaped cave in it and the other has an odd-shaped cavity that passes all the way through it.

SP-12 is about 140 m at 240 degrees from SP-13, at the top of a ridge. It is in the middle of a large rock outcropping, at the base of a large rock, visible from the next three stations.

SP-11 is about 100 m at 280 degrees from SP-12, at the top of a small ridge.


South Point Chaparral -- Hill 1017
use photos ECR 545 or ECN 231
to Soledad Mtn.
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to Johnson's Lee
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19
20
ROAD
DRAINAGES
BARE ROCK
CONTOUR LINES
STATION
SUGGESTED PARKING

[7]

South-facing Canyon Transects: Jolla Vieja Canyon

The stations are numbered from the mouth of the canyon, heading north. Drive past the canyon's mouth and north until the road passes the edge of the canyon above JV-06, where the vehicle can be parked. Observer #2 will descend to the canyon bottom from here and begin at JV-08, moving next to JV-09, etc. Observer #1 will continue down the road by foot to the next unnamed gully that crosses the road and which contains JV-18, JV-19 and JV-20. Observer #1 will then return to the vehicle, drive to the mouth of the canyon proper, and start at JV-01.

The term "gorge" will refer to the channel at the bottom of the canyon with steep walls, above which there is usually a relatively level area at least on one side.

Observer #1:

JV-08 is 100 m up canyon from JV-07. Cross over the gorge again and go past the cattails. It is best to head straight down into the gully from JV-07 and ascend the north wall using the game trail that extends up from the cattails. The station is about 7 m up from the gorge floor above a huge boulder topped with coreopsis and fuchsia, across from many toyons. It is marked with a short angle-iron stake in sage on the canyon side above the boulder, near a major game trail.

JV-09 is 115 m up-canyon from JV-08 on the same (by now north) side of the gorge. Traverse along the game trail that passes JV-08 to the small plateau jutting south into the gorge. The station is marked by an angle-iron stake pounded into the west side of the plateau at the edge. A lone toyon is at an azimuth of about 275 degrees.

JV-10 is 100 m up canyon from JV-09 on the north side of the gorge. It is beyond the toyon on the gorge floor, on a peninsula of the plateau formed between a major cattle trail and the gorge and across from two small toyon.

JV-11 is 100 m up-canyon from JV-10, again on the north side of the gorge. It is 20 m past where two toyon stand opposite and across the gorge from each other, and is opposite a large exposed area of an angled greenish rock formation in the bottom of the gorge. The station is above two large coreopsis in the gorge wall.

JV-12 is 100 m up-canyon on the north side, past several large boulders in the gorge. It is across from two toyons near each other on the cliff side, and at the top of a cattle trail that leads into the gorge. It is marked by a cairn of two rocks.

JV-13 is 150 m up-canyon from JV-12. Cross over to the south side of the gorge. The station is marked by an angle-iron stake above a large, round boulder in mid-stream. It is between two large toyon in the gorge, and across from two steep, side gullies lined with toyon.

JV-14 is 210 m up-canyon from JV-13 on the north side of the gorge across from a large toyon with a 4 m stretch of exposed root that is dividing into two. The station is set at a 1 m long brown sandstone boulder (no stake).

JV-15 is 120 m up-canyon from JV –14, down into the gorge on the north side of the streambed. There is a thin shelf of sandstone sticking into the air at an angle by it and several toyon across on the south side. It is marked by a rock cairn and an angle-iron stake next to a large rock.

JV-16 is 125 m up-canyon from JV-15 on the north side of the stream-bed, and about 10 downstream from a deep pool and waterfall. It is marked by a small rock set near another rock mostly buried at the edge of the stream.

JV-17 is 160 m up-canyon from JV-16 on the north rim of the gorge on a thin strip of plateau between a cattle trail and the gully. It is due north of the last of three large toyon on the south side and is marked by a small white rock. It is easiest to traverse high above the waterfall.

Observer #2:

The next three stations are in a small, unnamed gully between La Jolla Vieja and Wreck Canyons. They are all on the north side of the road and on the major western arm of this gully.

JV-18 is where the western arm of the canyon runs parallel to the road. Drop down into the canyon above a small, lone toyon and cross over to the eroded knoll in the middle of the gully, north of the main stream channel. The station is here, marked with a medium-sized rock and a short angle-iron stake, at an azimuth of about 50 degrees from the lone toyon.

JV-19 is 120 m from JV-18 at an azimuth of 140 degrees. It is on the west side of the major western branch of the canyon, opposite a badly eroded area and almost above a 7 m high waterfall at about 220 degrees. Walk up the bottom of the gully. Just before the waterfall is a side gully to the left which allows access to JV-19. It is marked by two medium-sized rocks and a short angle-iron stake in an open area.

JV-20 is 100 m from JV-19 at an azimuth of 140 degrees. It is still on the west side of the canyon in the middle of a relatively thick patch of sage and Baccharis. The station is on a mostly bare and gently sloping arm that stretches northeast into the canyon. It is marked by a cairn of three rocks with a short angle stake at its base.

The next seven stations are back in the main canyon.

JV-01 is on the west side of the canyon on the rim of the gorge on a promontory halfway between two lemonadeberry plants (Rhus *integrifolia*). The gorge has a few toyon and lemonadeberry clumps and some stagnant water during the dry season. The plateau is mostly grassland with sage at the periphery. It is marked by one angle-iron stake on a spit of land at the gorge.

JV-02 is 240 m as the crow flies from JV-01 at 330 degrees. You must cross the stream two times. It is just north of a major braid of cattle trails leading out of the canyon to the west and is currently marked by a cairn of two flat stones with an angle-iron stake pounded flush.

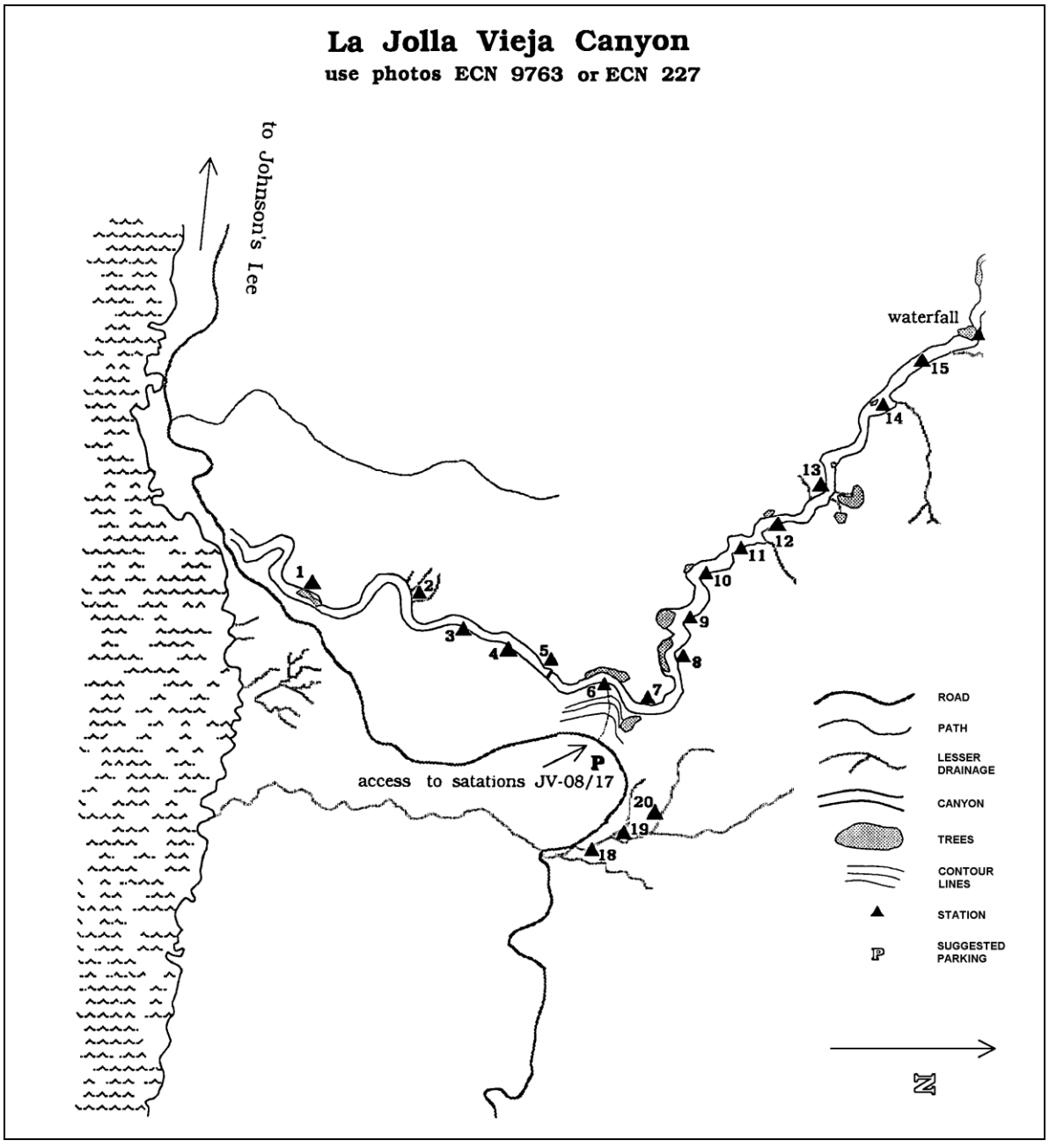
JV-03 is 180 m due north along the canyon from JV-02. Cross over to the east side and walk part-way up an orange dirt ledge. The station is about 18 m above the gorge floor, marked with an angle-iron stake.

JV-04 is 100 m up-canyon from JV-03 on the same side of the gorge. It is at the edge of the gorge about 3 m up from the bottom. The station is marked by a large rock with large, yellow lichen patches on one side and a cairn and an angle-iron stake on the other.

JV-05 is 100 m up canyon from JV-04 and about 7 m up from a stone shelf in the streambed, which may form a waterfall in the wet season. Cross over to the west side of the gorge. It is 125 degrees from a nearby lone toyon. At the edge of visibility to the north is a large Opuntia at 50 m. The station is marked with a low stake next to a "mangy-looking" rock and a small Baccharis.

JV-06 is 130 m up-canyon from JV-05. Cross over to a wide plateau on the east side of the gorge, opposite many toyon. The largest clump of toyon is at an azimuth of 240 degrees from the station. The station is marked by a .75 m long saddle-shaped rock with orange lichens and a basal angle-iron stake.

JV-07 is 105 m up-canyon from JV-06. Cross over to the west side of the gorge. The station is opposite a very steep side gully with many toyon. It is 7 m up from the gorge floor and 4 m from the top of a large toyon in the gorge marked with an angle-iron stake partly hidden in sage.


La Jolla Vieja Canyon
use photos ECN 9763 or ECN 227
to Johnson's Lee
waterfall
access to satations JV-08/17
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ROAD
PATH
LESSER DRAINAGE
CANYON
TREES
CONTOUR LINES
STATION
SUGGESTED PARKING
N

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APPENDIX I

The Program ‘BIRD2’ and How to Use It

This appendix contains the instructions for using the program 'BIRD2' on the Psion Organizer II hand-held data-loggers (Psion PCL, United Kingdom). Text of the program follows the instructions. 'BIRD2' was designed for the use of the resource management personnel of Channel Islands National Park for the Santa Rosa Island land bird monitoring project. It was written by Charles Drost and Paul E. Super on 4 September, 1990. For more detailed operating instructions, please see the Psion manual.

The program 'BIRD2' may be accessed in the following manner:

1. Press the 'ON/CLEAR' key to boot the main menu.
2. Press the 'P' key to get into the program menu.
3. Press the 'R' key, at which the screen will ask for which program to run 'RUN A: '.
4. Use the 'MODE' key to change the drive (A:, B:, etc.) to find the drive containing the program, usually B:.
5. Type the name 'BIRD2' at the prompt (the 'SHIFT' key will have to be used to type '2').
6. Press the 'EXE' key to start the program and get to the first choice menu 'ADD WEATH QUIT'. Note: Do NOT press 'A' (to start adding data) until the start of the count period as pressing 'A' sets the time which will be entered with the data for that station.
7. To abort at any time before pressing the 'EXE' key, or to get out of most paths one has inadvertently gone down with a miss-pressed key, press the 'ON/CLEAR' key several times until the main menu is reached.
8. To finish entering data, press 'Q' at the first choice menu, then press the 'ON/CLEAR' key several times until the main menu is reached.
9. To turn off the Psion, press 'O' at the main menu.

Input fields

The following input fields are included in the program (here with explanation).

Count Data ('ADD' on the first choice menu)

- 'OBS'--Observer. A three letter identification code for each observer, usually his or her initials.
- 'DATE'--The date of the count. The program takes this automatically from the Psion's internal clock.
- 'STN'--Station. This is the 4-character code for each station found in the directions section of this handbook and on an identification tag at each station. The 'SHIFT' key must be used to type in numerals.

- 'TIME'--The time the count at each station is begun. The program takes this automatically from the Psion's internal clock. The time does not change until the observer returns to the first choice menu ('ADD WEATH QUIT'), so that the observer can keep track of how much time has elapsed since the count started. The observer should return to the first choice menu by choosing 'EXIT' after leaving each station, as this resets the time. Be aware that the Psion often drops out zeros when transcribing the time into this field, so the 'TIME' must often be edited.
- 'SP'--Species. This is a 4-letter code specific to each bird species, standardized by the American Ornithologist's Union. The codes for the Island's breeding species are listed in Table 1. If the observer does not know the code for a species, the observer may invent one and write the name out in full under the Comments field.
- 'AGE/SX'--Age or Sex. Up to 3 characters can be entered here if the age and/or sex of the bird can be identified. Suggested entries include 'A' for adult, 'I' for immature, 'M' for male, and 'F' for female. If no age or sex is identifiable, this field may be left blank or 'U' may be entered for unknown. This is of greatest use for raptors, which are easily sexed and aged, providing more complete information for an uncommonly encountered species.
- 'NUM'--Number of individuals. This field will accept numbers from 0 to 999. If two or more individuals are at significantly different distances from the observer, they should be entered independently. The program will not allow this field to be left blank.
- 'DIST'--Distance. This field will accept numbers from 0 to 99. For circular-plot counts, this is the HORIZONTAL distance from the observer to the bird or to the center of the flock of birds, when FIRST DETECTED. The distance to a flock of birds is the distance from the observer (or walking-transect line) to the center of the flock. The program will not allow this field to be left blank.
- 'SEE/HE'--Seen or Heard. This field is for entering the sense with which the observer first detected the bird, either by sight (enter 'S') or by sound (enter 'H'). If the observer later confirms the detection with another sense, 'SH' or 'HS' may be entered.
- 'COMM'--Additional comments. This field allows the observer to enter any additional comments up to 40 characters long. The 'SHIFT' key must be used to type in numerals. This field is primarily used for entering corrections to fields previously miss-entered which can be updated after the data is down-loaded. From here, once the observer presses the 'EXE' key, the record is stored into the file and a second choice window is brought up, 'ADD EXIT'. Type 'A' if more observations are to be entered at this station, type 'E' if it is time to move to another station.

Weather Data ('WEATH' on the first choice menu)

- 'DATE'--The date of the count. See under Count Data.
- 'TIME'--The time the weather data is entered. See under Count Data. A new time is entered automatically each time 'WEATH' is selected from the first choice menu.

- 'STATION'--Count station. See under Count Data.
- 'WEATHER'--Weather conditions. A 3-letter code for the general weather conditions. Suggested entries include 'CLR' for clear, 'OVC' for overcast, 'BRK' for mostly cloudy, and ISCTI for mostly clear.
- 'WND (KNOTS)'--An estimate of the wind speed in knots. The program will not allow this field to be left blank.
- 'VISIBILITY'--Horizontal visibility in meters. The program will not allow this field to be left blank.
- 'PPT (Y/N)'--Precipitation. Enter 'Y' if rain or heavy mist is falling. Enter 'N' if there is not precipitation.
- '% OVERCAST'--Percent of cloud cover. The program will not allow this field to be left blank.
- 'COMMENTS'--Other comments. This field allows the observer to enter any additional comments up to 40 characters long. The 'SHIFT' key will have to be used to type in numerals. This field is primarily used for entering wind gust speed, type of precipitation, or corrections to fields previously miss-entered which can be updated after the data is down-loaded. From here, once the observer presses the 'EXE' key, the record is stored into the file and a second choice window is brought up, 'WEATH EXIT'. Type 'W' if weather conditions have changed during the previous entry and require describing again, otherwise type 'E' and proceed with the count.

‘BIRD2’ Program Code

```
LOCAL OB$(3), DATE$(8), STN$(4), TIME$(4), SP$(4), AS$(3), NO%, DIST%, SH$(3),
      COMM$(40), CHOICE$(1), KEY%, KEY1%, POS%, WEATH$(4), WND%, VIS%,
      PPT$(2), OVC%

TRAP USE A :TRAP CLOSE :TRAP USE B :TRAP CLOSE :TRAP USE C :TRAP

      CLOSE :TRAP USE C :TRAP CLOSE :TRAP USE D :TRAP CLOSE

WHILE KEY1%<3

KEY1%=MENU("Add,Weath,Quit")

IF KEY1%=1

      IF EXIST (11B: BIRD")   :OPEN "B:BIRD",A, OB$, DATE$, STN$, TIME$, SP$, AS$,
NO%,   DIST%, SH$, COMM$ :ELSE :CREATE "B:BIRD",A, OB$, DATE$, STN$, TIME$, SP$,
AS$, NO%, DIST%, SH$, COMM$ :ENDIF

      DATE$=GEN$(MONTH,2)+"/"+GEN$(DAY,2)+"/"+RIGHT$(GEN$(YEAR,4),2)

      TIME$=GEN$(HOUR,2)+GEN$(MINUTE,2)

      KEY%=0

      WHILE KEY%<2

            LAST

            OB$=A.OB$ :SP$=1111          :STNS=A.STN$ :COMM$=""

            PRINT "Obs     "; :EDIT OB$ :A.OB$=OB$ :KSTAT 3

            PRINT "Date    "; :EDIT DATE$ :A.DATE$=DATE$ :KSTAT 1

            PRINT "Stn     "; :EDIT STN$ :A.STN$=STN$ :KSTAT 3

            PRINT "Time    "; :EDIT TIME$ :A.TIME$=TIME$ :KSTAT 1

            PRINT "Sp      "; :EDIT SP$ :A.SP$=SP$

            PRINT "Age/Sx "; :EDIT AS$ :A.AS$=AS$ :KSTAT 3

            PRINT "Num     "; :INPUT NO% :A.NO%=NO%

            PRINT "Dist    "; :INPUT DIST% :A.DIST%=DIST% :KSTAT 1

            PRINT "See/He "; :EDIT SH$ :A.SH$=SH$

            PRINT "Comm  "; :EDIT COMM$ :A.COMM$=COMM$

            APPEND

            KEY%=MENU("Add,Exit")

      ENDWH

      CLOSE

ELSEIF KEY1%=2

      IF EXIST("B:BRDWEATH") :OPEN "B:BRDWEATH",A, DATE$, STN$, TIME$, WEATH$,
      WND%, VIS%, PPT$, OVC%, COMM$ :ELSE

      :CREATE "B:BRDWEATH",A, DATE$, STN$, TIME$, WEATH$, WND%, VIS%, PPT$,
      OVC%, COMM$ :ENDIF :KSTAT 1

      DATE$=GEN$(MONTH,2)+"/"+GEN$(DAY,2)+"/"+RIGHT$(GEN$(YEAR,4),2)

      TIME$=GEN$(HOUR,2)+GEN$(MINUTE,2)
```

```
        KEY%=0
        WHILE KEY%<2
                LAST
                COMM$="" :KSTAT 3
                PRINT "Date     "; :EDIT DATE$ :A.DATE$=DATE$
                PRINT "Time     "; :EDIT TIME$ :A.TIME$=TIME$ :KSTAT 1
                PRINT "Station ";          :EDIT STN$ :A.STN$=STN$
                PRINT "Weather          "; :EDIT WEATH$ :A.WEATH$=WEATH$ :KSTAT 3
                PRINT "Wnd (knots)      "; :INPUT WND% :A.WND%=WND%
                PRINT "Visibility       "; :INPUT VIS% :A.VIS%=VIS% :KSTAT 1
                PRINT "PPT (Y/N)        "; :EDIT PPT$ :A.PPT$=PPT$ :KSTAT 3
                PRINT "% Overcast       "; :INPUT OVC% :A.OVC%=OVC% :KSTAT 1
PRINT "Comments     "; :EDIT COMM$ :A.COMM$=COMM$
                APPEND
                KEYS=MENU("WEATH,EXIT")
        ENDWH
        CLOSE
ENDIF
ENDWH
```

APPENDIX II

Vegetation Transect Cross Reference

This appendix contains a list of the vegetation monitoring transects that best correspond with each sub-set of land bird monitoring stations described in this monitoring handbook. The vegetation transect numbers refer to those assigned in the Santa Rosa Vegetation Monitoring Handbook (Halvorson et al., in preparation) and their locations and characteristics are described in detail in that publication.

Habitat Type	Vegetation Transect(s)
Torrey Pines	62, 63, 65, 66, & 67
Island Oaks	
Black Mountain (between I-01 and I-04)	74
Soledad Mountain	none
Mixed Woodland	
Cherry Canyon (near W-07)	71
Cherry Canyon (near W-10)	70
Closed-cone Pines	72
North-facing Canyon — Lobos Canyon	
Woodland (LC-01 through LC-04)	83
Woodland (LC-07, LC-08, LC-09, LC-10, LC-13, LC-18)	68
Coastal Scrub	57
South-facing Canyon — La Jolla Vieja Canyon	
Riparian Woodland (near JV-08)	85
Coastal Scrub (closest)	60
Coastal Scrub	
Stations SC-01 through SC-05	29
Stations SC-06 through SC-10	58 & 59
Cherry Canyon	20
Lupines	
Dark Green (Lupinus *arboreus*) (L-01/06, L-13/15, L-20)	17
Gray (L. *albifrons*) (L-07/12, L-16/19)	16
Chaparral	
Beecher's Bay (between C-01 and C-10)	11
South Point Road	34 & 35
Grasslands	
Pocket Field	48
East Point (within SG-01)	01
Black Mountain (1 km south at Army Camp)	31
Estuaries/Salt Marshes	
EM-01	07
EM-02	06